

AD 726651
REPORT- 71-1944

LANGUAGE OF INFORMATION SCIENCE

Convertibility in Information Science

Final Report - Part II

January 1971

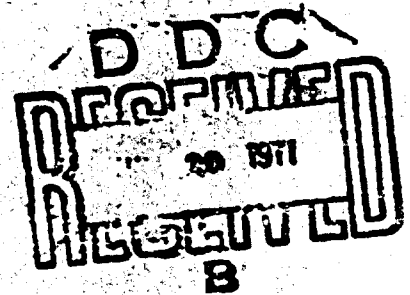
Prepared for:

U.S. Air Force Office of Scientific Research
Washington, D.C.

BIOLOGICAL SCIENCES COMMUNICATION PROJECT
THE GEORGE WASHINGTON UNIVERSITY MEDICAL CENTER
2001 S STREET, N.W., WASHINGTON, D.C. 20009
Telephone (202) 462-5828

Reproduced by
NATIONAL TECHNICAL
INFORMATION SERVICE
Springfield, Va. 22151

Approved for public release;
distribution unlimited.



FINAL REPORT

PART II

U.S. Air Force Office of Scientific Research

Contract #F44620-69-C-0087

LANGUAGE OF INFORMATION SCIENCE

Convertibility in Information Systems

by

Patricia O. Fuellhart
David C. Weeks

January 1971

Biological Sciences Communication Project
The George Washington University Medical Center
Department of Medical and Public Affairs

Charles W. Shilling, M.D., Director
Biological Sciences Communication Project

Approved for public release;
distribution unlimited.

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D		
(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)		
1. ORIGINATING ACTIVITY (Corporate author) George Washington University Department of Medical and Public Affairs Washington, D.C.		2. REPORT SECURITY CLASSIFICATION UNCLASSIFIED
3. REPORT TITLE LANGUAGE OF INFORMATION SCIENCE: CONVERTIBILITY IN INFORMATION SYSTEMS (PART II)		2b. GROUP
4. DESCRIPTIVE NOTES (Type of report and inclusive dates) Scientific Final		
5. AUTHOR(S) (First name, middle initial, last name) Patricia O. Fuellhart David C. Weeks		
6. REPORT DATE January 1971	7a. TOTAL NO. OF PAGES 196	7b. NO. OF REFS 3
8a. CONTRACT OR GRANT NO. F44620-69-C-0087	9a. ORIGINATOR'S REPORT NUMBER(S)	
b. PROJECT NO. 9778	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report) AFOSR-TR-71-1944	
c. 61102F		
d. 681313		
10. DISTRIBUTION STATEMENT Approved for public release; distribution unlimited.		
11. SUPPLEMENTARY NOTES TECH, OTHER	12. SPONSORING MILITARY ACTIVITY AIR FORCE OFFICE OF SCIENTIFIC RESEARCH (NL) 1400 WILSON BLVD ARLINGTON, VIRGINIA 22209	
13. ABSTRACT <p>This report was produced under AFOSR contract F 44620-69-C-0087. It is the result of a study of the language of information science based on the terminology contained in a collected set of lexical resources. The terms employed were taken from vocabularies having a substantial degree of overlap. All terms were then analyzed to build a composite vocabulary of terms and concepts using a set of twenty-five explicitly defined subject groups. The vehicle for this task was the <u>Intermediate Lexicon</u> of the <u>Groupe d'Etude sur l'Information Scientifique</u>, selected because it represents an international consensus of the domain of information science. A demonstration of the convertibility of indexing languages by means of an Intermediate Lexicon is included in the study. More than 3000 discrete descriptors are tabulated in assigned subject groups within the Lexicon structure. The autonomy and universality of the defined subject groups are also demonstrated in the tables.</p>		

DD FORM 1473

NOV 65

UNCLASSIFIED

Security Classification

ABSTRACT

This report was produced under AFOSR contract F 44620-69-C-0087. It is the result of a study of the language of information science based on the terminology contained in a collected set of lexical resources. The terms employed were taken from vocabularies having a substantial degree of overlap. All terms were then analyzed to build a composite vocabulary of terms and concepts using a set of twenty-five explicitly defined subject groups. The vehicle for this task was the Intermediate Lexicon of the Groupe d'Etude sur l'Information Scientifique, selected because it represents an international consensus of the domain of information science. A demonstration of the convertibility of indexing languages by means of an Intermediate Lexicon is included in the study. More than 3000 discrete descriptors are tabulated in assigned subject groups within the Lexicon structure. The autonomy and universality of the defined subject groups are also demonstrated in the tables.

ACKNOWLEDGMENT

We gratefully acknowledge the assistance of E.J. Coates, Editor, British Technology Index, and J. Mills, Northwest Polytechnic, London. The assignment of descriptors to the twenty-five subject groups has clearly benefited from their counsel. Mr. Coates has been a participant in the production of the Intermediate Lexicon used in this study since the meeting of the first working party at Marseille in 1966 and his knowledge of its intent was a valuable guide to a valid distribution of descriptors. But responsibility for the entire report remains inescapably with the authors.

Patricia Tangas has performed the difficult task of preparing the study manuscript for publication with exceeding patience and skill.

CONTENTS

	<u>Page</u>
Abstract	ii
Acknowledgements	iii
Introduction	1
Background	2
A Construct of Information Science	6
Category "A" - Subjects	9
Purpose	13
Methodology	15
Analysis	17
Appendix A - Subject Groups	26-A
Appendix B - Concordance Table	26-B

INTRODUCTION

In 1968 a study was performed on the compilation and analysis of lexical resources in information science.¹ Primarily, that study was intended to locate, to collect lexical tools and to compare their content as the initial phase of a research program on the language of information science. While some commonality was observed from an aggregate of the terms found in more than twenty sources, the diversity proved to be even more pronounced. This was not unexpected. Authority files built for a particular application will always differ since they are necessarily constructed to reflect the interests of their sponsoring organization. But a discipline can be presumed to have a body of knowledge in its own right and a set of concepts and terminology used generally in its literature and discourse.

This project has used a selected group for the same lexical tools, all in English but in some instances translations from original languages, to construct a language of the discipline. A number of iterations may well be necessary before the product is able to stand close scrutiny. Its more immediate utility will be derived from serving as one input for the forthcoming research sponsored by OSTI and directed by Coates and Mills who will be experimenting with system-to-system conversion through the Intermediate Lexicon of the Groupe d'etudes sur l'information scientifique.

The Intermediate Lexicon was used in this study because it represents a construct of information science in which a number of experienced information specialists have participated. It divides the domain into a set of general categories and groups, each with a precise, detailed definition.

¹Compilation and Analysis of Lexical Resources in Information Science. Patricia O. Fuehlhart and D.C. Weeks. Washington, BSCP, George Washington University Communique 29-68, 15 June 1968. Research sponsored in part by Air Force Office of Scientific Research, Office of Aerospace Research Contract AF-AFOSR-1325-67 and in part by the National Library of Medicine under grant 5T01-LM-00101-02.

BACKGROUND

Compatibility and Convertability

The multidisciplinary nature of the field of scientific and technical information is implicit in its genesis and continued interchange. Fundamentally this discipline depends upon a number of others such as logic, linguistics, mathematics, computer technology for its apparatus and methods. Through application to other disciplines, information science has contributed to the organization of those fields. The development of information science and its applications have proceeded in parallel, with the emphasis perhaps leaning to application carried out with trial-and-error methods. One consequence has been the growth of a body of practitioners who were scientists first and information specialists afterward. This process is not reversible, suggesting that formal training will continue to follow education in science as the general pattern of entry into careers in information.

Although information science is still emerging as an established discipline as the branch of science that deals with technical information processing, the recognition of its foundations and the investigations of its various aspects have produced a substantial corpus of literature. As an object of study, this literature could be expected to yield some interesting conclusions about the nature of the discipline and the direction in which it may appear to be moving.

Organizations for documentation with the objective of collecting, organizing, analyzing and disseminating information related to the information science/documentation corpus of literature have noticeably increased over the past two decades. Although the scope of their collections and the activities of information analysis and storage may differ according to the requirements of the user communities served by these organizations, each documentation center is basically concerned with the same comprehensive corpus of literature. Ideally, each would profit from access to the document systems maintained by other organizations. The degree to which this access presently exists is a measure of duplication rather than system-to-system communication.

A major impediment to access by exchange rests with the indexing tools and classification schemes, i.e. the indexing language used by each system. The nature of the lexical resource - classification schemes, thesauri, descriptor lists and documentary lexicons (such as dictionaries and glossaries) and its conceptual construct and representation differ widely from organization to organization. However, these

BACKGROUND

Compatibility and Convertability

The multidisciplinary nature of the field of scientific and technical information is implicit in its genesis and continued interchange. Fundamentally this discipline depends upon a number of others such as logic, linguistics, mathematics, computer technology for its apparatus and methods. Through application to other disciplines, information science has contributed to the organization of those fields. The development of information science and its applications have proceeded in parallel, with the emphasis perhaps leaning to application carried out with trial-and-error methods. One consequence has been the growth of a body of practitioners who were scientists first and information specialists afterward. This process is not reversible, suggesting that formal training will continue to follow education in science as the general pattern of entry into careers in information.

Although information science is still emerging as an established discipline as the branch of science that deals with technical information processing, the recognition of its foundations and the investigations of its various aspects have produced a substantial corpus of literature. As an object of study, this literature could be expected to yield some interesting conclusions about the nature of the discipline and the direction in which it may appear to be moving.

Organizations for documentation with the objective of collecting, organizing, analyzing and disseminating information related to the information science/documentation corpus of literature have noticeably increased over the past two decades. Although the scope of their collections and the activities of information analysis and storage may differ according to the requirements of the user communities served by these organizations, each documentation center is basically concerned with the same comprehensive corpus of literature. Ideally, each would profit from access to the document systems maintained by other organizations. The degree to which this access presently exists is a measure of duplication rather than system-to-system communication.

A major impediment to access by exchange rests with the indexing tools and classification schemes, i.e. the indexing language used by each system. The nature of the lexical resource - classification schemes, thesauri, descriptor lists and documentary lexicons (such as dictionaries and glossaries) and its conceptual construct and representation differ widely from organization to organization. However, these

ordering systems do possess common semantic attributes, as they must since they represent concepts which appear in the literature of information science. These concepts are representative not only of the discipline of information science but also of the applications of such concepts to the processing of scientific and technical information. It is this commonality on which expectations of convertibility between document systems via respective indexing languages are based. Convertibility at the input-processing stage is a prerequisite to providing organizations devoted to information science documentation with efficient and effective access to the relevant document store of other, similar organizations.

Convertibility has often been interpreted to mean standardization - a not altogether welcome or desirable end since it implies a rejection of local slant or bias in favor of uniformity. A more appropriate objective is communication between systems without forcing the participants to first become identical as the cost of admission.

If systems are to communicate in a language that is not altogether their own, then clearly some common language must be available. Given the need to formalize and control the indexing-retrieval language of an information system, such languages are already meta-languages, placing certain restraints on the vocabulary and syntax permitted for the description of documentary information and for formulating queries. Still another structured language or meta language to serve as a system to system communication language suggests even greater restraints. This need not be true. But until such a resource is developed, little is known about the total vocabulary of information science or the degree to which numerous sub-sets are encompassed within it.

The research of this project has been aimed at developing an initial, common vocabulary which will contribute to devising methods of communication. The language that describes communication in a discipline can never be as flexible nor varied as that of speech or writing. It must be restrictive and devoid of variety so that things and ideas that are similar can be described in similar terms. The meta languages analyzed here are dissimilar in many respects - none of them fundamental, but largely in detail. These lexical sources were not conceived as definitive lexicons of information science; most reflect their individual purpose and very likely suit those purposes very well.

Whether any lexicon can claim to be normative is problematic. Only within an application can one set of decisions be made prescriptive. But if several applications are joined, however loosely, some common means of description will be essential for communication. This kind of uniformity is promoted by efforts to achieve a set of descriptors that can be used as a tool at more than one installation. In producing such

a lexicon, local slant and viewpoints are lost but commonalities become more evident as a somewhat 'sterilized' language emerges.

If the processes of analysis and semantic reduction necessarily remove idiosyncracies from a number of sources, these same steps can be said to yield a core language of a discipline. In the process, individual descriptors tend to acquire smaller, more general intension and thus increase their extension. One kind of utility that may be inherent in an intermediate lexicon should be demonstrated by Coates and Mills in their index conversion experiment, using an intermediate language to transfer records from one system to another. Other uses can be found in examining the common language as a resource for discovering characteristics of the discipline itself.

Information science has been more successful in establishing methods of information handling both for mission oriented agencies and for disciplines, particularly in physical science, than it has in defining and structuring itself. One clear indicator of a mature discipline is the uniform nature of formal education for entry into a profession. Information science still lacks such uniformity. One viewpoint sees the discipline as 'documentation' - the means of handling information; another regards the discipline as one devoted to the study of information, its characteristics and behavior. To a degree, the two viewpoints are both reflected in the definition framed for the initial study and used in this study as a measure for the assessment of terms: "the study and development of conceptual, methodological, and technological foundations for the control and distribution of substantive information. These foundations apply equally to the collection, storage, manipulation and retrieval of information and to the characteristics of information itself."¹

Despite the differences in stating what information science is, there is a quite general similarity in the things it does when brought to bear on the development of information systems. There, apart from a few experimental programs, similarities have increased in recent years. Special purpose equipment which was developed for some earlier applications seems to have largely disappeared. General purpose equipment, thesauri as authority files and coordinate indexing techniques have become a common ground for scientific and technical information systems design.

If practitioners are to develop an intellectual basis and a body of knowledge, a mature language of the discipline is an essential tool of communication. Communication between systems may be the easier place

¹Op. Cit., Fuellhart and Weeks, p. 3.

to begin. Things and processes can be more tractable than people; indexing languages, however imperfect, are free from the qualifiers that make written and oral communication more stimulating, but often deliberately vague and imprecise.

Commonality

In order to effect convertibility between many document systems which have commonality of concepts certain fundamental problems must be addressed. Wall and Barnes² have indicated that the subject content, or the scope of coverage of the system, creates a viewpoint which affects the meaning of terms in an indexing vocabulary. They have identified the fundamental problems which arise in effecting convertibility between lexical resources as generic problems and semantic problems.

Ideally, the work of combining a number of indexing tools into a single lexicon should be performed by the authors of those same indexing languages. When performed, as in this instance, by researchers the assignment of terms to one lexicon group or another, the identification of synonyms, the retention or rejection of certain descriptors is largely arbitrary. Since the source materials were removed from their local context, the original viewpoints were unknown. To a degree, this simplifies the compilers' task, because varied interpretations are lost and terms which appear to be identical are treated as though they were. Only when hierarchical structure or explicit definition indicates an interpretation is it possible to distinguish between different meanings attached to terms.

Generic Problems

As Wall and Barnes indicated, the meaning of a term is dictated by the class of category to which it belongs in the lexical resource. Thus, problems in convertibility occur when classification schemes or other structured lexical resources are so constructed that they vary markedly in the specific levels of terms used. The levels of specificity are predicated on the requirements of the user community and can be evaluated or altered only within the framework of that environment.

There is one advantage available to the compiler of a conversion instrument. If that instrument were already in being, a number of unyielding conflicts would be certain to arise. His alternatives are then to force agreement by ignoring different generic levels or to leave some concepts unaccounted for among the equivalent terms. But if the conversion language is in process of being assembled, then the way remains open to find a solution that does not force equivalence where none is fitting or leave unsolved the more difficult problems.

²E. Wall, et. al., "Intersystem Compatibility and Convertibility of Subject Vocabularies," Auerbach Corporation, Philadelphia, Penn., 8 May 1969

Semantic Problems

Semantic problems encountered in effecting convertibility between lexical resources have been identified by Wall and Barnes as primarily problems in synonyms and homographs. These basic semantic problems are also encountered in document systems having basically the same scope of coverage and presenting the same basic concepts. Again, the concept term chosen from an array of synonyms and the meaning of the homograph is determined by the user's requirements as shaped by this environment.

In treating the semantic problems encountered in developing the capability for conversion between vocabularies, concomitant generic problems arise. Synonyms for basic concepts may vary the level of specificity or detail. A lexical tool for effecting convertibility between vocabularies must allow for the postable terms of one relevant vocabulary to be equated with the acceptable synonyms or postulate terms of other vocabularies.

The ideal method for effecting convertibility between the lexical resources of numerous organizations concerned with the field of information science documentation and with the processing of scientific and technical information is to develop a lexical resource which serves as the object vocabulary through which terms from one vocabulary with similar scope can be converted in terms of another vocabulary. This method is preferable to selecting one lexical resource from many as the object vocabulary. To use a vocabulary developed for a particular environment would arbitrarily establish the viewpoint and conventions of that vocabulary as the criteria of correctness. What is required is the development of a lexical resource which encompasses the universe of viewpoints from a general level to a specific level and allows for convertibility between any term accepted in one vocabulary to any comparable term in another vocabulary. Only if this requirement can be satisfied, can the exchange of resources and documents between systems be realistically and economically realized.

A CONSTRUCT OF INFORMATION SCIENCE

A substantial beginning in the development of such a resource has arisen from a study on compatability and convertibility of indexing tools for literature concerned with scientific information by the Groupe d'Etude sur l'Information Scientifique.³ The object of this study was to delineate the basic concepts which would form the framework for the organization of terms and specific concepts relative to scientific information processing. The delineation of these concepts and the development of this framework was based on the comparison of extant lists of descriptors intended to be used for

³An Outline Intermediate Lexicon to Assist Interconversion Between Terms Used in Various Indexing Languages in the Field of Scientific and Technical Information Processing. Compiled by an International Working Party convened by the Groupe D'Etude Sur L'Information Scientifique (Marseille and Paris) January 1968.

processing scientific and technical information. Systematic reviews by a group of experts and subsequent revisions based on their recommendations and on comparisons of the preliminary lexicon to additional lists of descriptors resulted in an "Intermediate Lexicon". An English translation of this "Intermediate Lexicon" developed by the International Working Party convened by the Groupe d'Etude sur l'Information Scientifique has been prepared by E.J. Coates and D.C. Weeks.⁴ This work sets forth in detail, the history, objectives and methodology, as well as a detailed presentation of the substance of the Intermediate Lexicon. The following sections are a summary of this document.

This Intermediate Lexicon is divided into six basic categories which pertain to all documentation languages. These categories are:

- A. The SUBJECT of the document.
- B. The FIELD of science or technology of concern.
- C. The LANGUAGE in which the scientific information is conveyed.
- D. The COUNTRY or region with which the study is concerned.
- E. The PERIOD concerned.
- F. The FORM of the document being indexed.

The category of subject is of primary importance, as it is the category which encompasses the universe of concepts which comprise the conceptual, methodological, and technological foundations of the processing of scientific and technical information. In the Intermediate Lexicon these concepts or ideas are arranged in 25 main groups which were observed in the descriptor lists and classification schemes concerned with scientific and technical information processing.

The English language version by Coates and Weeks indicates the rationale and the method whereby these 25 main groups were determined. These groups were constructed from general categories common to the various lexical resources reviewed. Compatibility was determined solely on the basis of semantic correspondences between groups of descriptors as they occurred in each list rather than as determined by the place of each category in the structure or classification framework of each list. In dealing with composite descriptors as they occurred in each list, convertibility was effected only at the explicit semantic level. Correspondence of combined descriptors as they occurred in each list was sought within the appropriate groups, depending on the explicit principal components of the descriptor in question.

⁴ E.J. Coates and D.C. Weeks, An Outline Intermediate Lexicon to Assist Interconversion Between Terms Used in Various Indexing Languages in the Field of Technical Information Processing. English Translation.

The study did not attempt to determine correspondences for secondary specifications of combined descriptors. Rather, correspondence was constrained to appropriate assignments of the principal conceptual components to the appropriate general categories. Although this method results in considerable semantic reduction, it is appropriate for the purpose of the study, i.e. to develop an Intermediate Lexicon capable of effecting compatibility between multiple lexical resources which may be expressed in numeric languages.

This method is appropriate for an Intermediate Lexicon responsive to the varying viewpoints and multiple language constructs in that:

1. It does not require the enumeration of all semantic factors or concepts which would occur from all viewpoints or all languages, but instead provides conceptual units useful for document analysis of the field in question regardless of viewpoint or language constraint;
2. It allows for the precise definition of each semantic unit of the Lexicon which in turn provides for convertibility between numerous lexical resources with varying levels of compound descriptors by providing a framework for determining correspondences through the elimination of ambiguities; and
3. By precisely defining semantic units at broad semantic level, each of which has nonetheless an independent meaning in the field of application. The Lexicon avoids use of overly broad terms which occur in natural language and which are actually comprised of several true concepts or descriptors.

The Intermediate Lexicon achieves its purpose in that it serves as a means for establishing correspondences between lexicons. The six principal facets provide for those aspects which are of concern in performing documentary analysis.

As indicated (previously) the Subject facet and its 25 main groups are of prime importance to the Lexicon as this facet represents at a carefully defined broad level the universe of concepts which apply to the field of information science and its application to the processing of scientific and technical information. The following is the outline of these 25 main groups:

CATEGORY "A"

SUBJECTS

List of "Groups" and Annexes

The headings are given successively in French and in English separated by the sign "/"; the underlined portion is that which might well be used as an abbreviated heading.

GROUP

1. L'INFORMATION SCIENTIFIQUE & TECHNIQUE (I.S.T.): GENERALITES
/SCIENTIFIC AND TECHNICAL INFORMATION IN SOCIAL CONTEXT
2. PROFESSION
/PERSONNEL
3. LA SCIENCE DE L'I.S.T.
/SCIENTIFIC & TECHNICAL INFORMATION PROCESSING AS A SCIENCE
4. SCIENCES & TECHNIQUES CONNEXES
/FRINGE TECHNIQUES AND SCIENCES
5. ORGANISMS D'I.S.T.
/ORGANIZATIONS: INTERNAL ORGANIZATION OF INDIVIDUAL UNITS
6. ORGANISATION DE L'I.S.T.: STRUCTURE
/ORGANIZATIONS AND ORGANIZED NETWORKS: STRUCTURE
7. FONTIONNEMENT DE L'I.S.T.
/ORGANIZATIONS AND ORGANIZED NETWORKS: FUNCTIONING
8. TYPES DE DOCUMENTS
/DOCUMENTARY MATERIALS
9. REPRODUCTION
/REPROGRAPHY
10. TRAITEMENT DE L'I.S.T.: GENERALITES
/SCIENTIFIC & TECHNICAL INFORMATION PROCESSING: GENERAL
11. COLLECTE DES INFORMATIONS
/COLLECTION OF INFORMATION

GROUP

12. ANALYSE DOCUMENTAIRE: GENERALITES
/DOCUMENTARY ANALYSIS FOR RETRIEVAL: GENERAL
13. CATALOGAGE
/CATALOGING
14. CONDENSATION: RESUMES
/ABSTRACTING AND ANNOTATING
15. SYNTHESE
/SURVEYS OF DOCUMENT CONTENT
16. CLASSIFICATION & INDEXATION
/CLASSIFICATION & INDEXING
17. EXTRACTION, TABULATION: INDEX
/INDEX MAKING BY EXTRACTING TERMS FROM INPUT
18. TRADUCTION
/TRANSLATION
19. CODIFICATION
/CODIFICATION
20. ENRIGISTREMENT & STOCKAGE
/INPUT & STORAGE
21. EXPLOITATION DOCUMENTAIRE
/FILE EXPLOITATION
22. DIFFUSION
/DISSEMINATION
23. MATERIEL
/EQUIPMENT AND SOFTWARE
24. TERMINOLOGIE & LEXICOGRAPHIE
/TERMINOLOGY & LEXICOGRAPHY
25. NORMALISATION
/STANDARDIZATION

ANNEX

- I. PERSONNES
/PERSONS
- II. ORGANISMES
/ORGANIZATIONS
- III. SYSTEMES
/SYSTEMS
- IV. EQUIPMENTS
/EQUIPMENT
- V. PUBLICATIONS
/PUBLICATIONS

The Intermediate Lexicon is in a preliminary state of development. In accordance with its present purpose it does not enumerate detailed specific descriptors which comprise the subsets of each of the 25 primary concepts. To do so would restrict the capability to establish correspondence between lexicons using varying forms of related concepts, e.g. single term or combined descriptors, by imposing arbitrary conventions which would be incompatible with the unique requirements of organizations developing the list.

A long range objective of the Working Party was to expand the Intermediate Lexicon by establishing numerous equivalents between elements in the individual descriptors. The proposed means for establishing these equivalences is a concordance table where descriptors in each of the lists $L_1, L_2 \dots L_n$ are related to each other and to the Intermediate Lexicon L_0 . The Intermediate Lexicon, L_0 , serves as the intermediary language for translating L_i to L_j and which is itself inferred from the existing list $L_1 \dots L_n$ (1)" [4]. The following table and explanation is extracted from the English version and represents the basic algorithm by which the Intermediate Lexicon can be extended.

L_0	L_1	L_2	L_n
t_i^0	$= t_i^1$	$\subset t_i^2$	$= t_i^n \cdot t_j^n$
t_2^0	$\subset t_k^1, t_1^1$	$= t_k^2$	0
t_n^0	----	----	----

PURPOSE

The purpose for which this study was made was twofold:

1. To demonstrate how the Intermediate Lexicon may be extended by extracting descriptors from a compilation of English language (including translations to English) lexical resources which function as operational indexing tools by
 - a. relating these descriptors to the Intermediate Lexicon, and
 - b. relating them to each other by utilizing the concordance table construct;
2. To examine the results to demonstrate:
 - a. the autonomy and universality of the subject categories in the Intermediate Lexicon; and
 - b. the capability for [empirically] developing the explicit hierarchy which is presently implicit in each subject category of the Intermediate Lexicon by virtue of the precise definitions developed for each category.

Extension of the Intermediate Lexicon. As has been previously stated, there is no intent to develop the subject categories of the Intermediate Lexicon to include a unique list of descriptors. However, in functioning as a vehicle for effecting correspondences between indexing languages, it must ultimately be responsive to concepts as represented by descriptors selected for operational indexing tools which are expressed in the same language, English, to each other and to the subject categories of the Intermediate Lexicon it was expected that a framework of specific descriptors could be constructed. This framework would provide a corpus of descriptors which would serve as a partial base from which the primary concepts delineated by the subject categories may be extended to define the subsets of concepts which are implicit or explicit in the primary concepts. The definition of subsets of concepts would assist in extending the implicit hierarchy inherent in the Intermediate Lexicon and would, as a result, increase the efficiency of the Lexicon in effecting compatibility between indexing systems.

Autonomy and universality of the subject categories. The development of primary subject categories which represent broad concepts with precise, independent meanings in each field of application produces semantic autonomy. Semantic autonomy implies that the meanings of concepts are stable and semantic problems such as synonymy and homographs can be more readily resolved in effecting correspondences between descriptor lists. The universality of the subject categories is a quality that the Intermediate Lexicon possesses in that the categories represent "the totality of ideas which make up the conceptual tools of scientific and technical information." With the assumption that the Intermediate Lexicon possesses these qualities, of autonomy and universality it was expected that an analysis of the relationships among descriptors extracted from the various indexing resources and the relationships of these resources to the Lexicon would demonstrate the presence of these qualities.

Empirical development of the hierarchy implicit in the subject category groups. By virtue of the precise definitions presented for each subject category group, there is an implicit hierarchy. The prime subject categories of the Intermediate Lexicon should determine which descriptors of any level of semantic detail, are to subsumed under that category. Thus both broader conceptual subsets of the category and specific detailed concepts would be arrayed within the same framework. By relating these two levels of terms within the concordance table, it was expected that descriptors representing broad conceptual subsets would be related to specific detailed descriptors.

METHODOLOGY

The methodology described in this section is related to the purpose of this study: to assisting in extending the Intermediate Lexicon; and to analyze the data in order to verify both the autonomy and universality of the subject categories of the Lexicon and the capability for empirically developing an explicit hierarchy within the framework of each subject category group.

Selection of lexical resources. Authority files utilized in the processing of information science/documentation literature were selected from the compilation of lexical resources cited in the introduction. This constraint was imposed on the selection of lexical resources to be included in the study with the purpose of replicating the problems of bias and viewpoint likely to be encountered in effecting system-to-system convertibility. According to this rationale, a total of fourteen authority files were selected for inclusion in this study. Although these authority files are identified by a description list code number in the various tables, the authors have purposefully refrained from identifying the source for each list in order to preclude evaluation of any given list without regard to its individual purpose.

Extending the Intermediate Lexicon. In order to provide a partial basis from which the Intermediate Lexicon may be extended, it was necessary to perform three basic tasks:

- Select descriptors from operational indexing languages which are available in the English language
- Organize these descriptors within the appropriate subject category groups of the Intermediate Lexicon
- Relate the selected descriptors to each other and to the Intermediate Lexicon in concordance table.

Selection of descriptors. Since indexing languages use a multiplicity of key terms and phrases to represent concepts, it was decided to use these terms as they occur in the descriptor lists rather than to identify concepts by initially grouping synonyms. The purpose of the Lexicon is to provide a vehicle for effecting correspondences between descriptor lists without placing external constraints on any list. In order to achieve this purpose the Lexicon must be responsive to the descriptor

lists in their natural form. Thus, there was minimal intervention in selecting word forms. The major form of intervention was to factor redundant multiple subject headings into semantic units when such factoring did not cause the loss of a compounded concept. In a limited number of descriptors, it was arbitrarily determined that the compounded concept could easily be represented by post-coordination and that the purpose of the study was better served by factoring into key elements.

The limitation imposed by the procedure is that resultant data can only serve as a partial base for extending the Lexicon in that not all descriptors are retained in their natural context. It was felt that this limitation was far outweighed by the capability to compare numerous key terms in relation to each other so that those key terms which occurred frequently might be considered as potential concepts designations in a later revision of the Lexicon. This limitation is further offset by the analysis of the hierarchy implicit in the relationships demonstrated in the concordance tables.

Organization of terms within subject category groups. The descriptors selected from the indexing language tools were initially related to the appropriate subject category groups. The appropriateness is determined by 1) viewpoint or definition when explicitly presented in the lexical resource and 2) the relationship of that viewpoint or term to the definition of the subject category group.

Construction of a concordance table. A concordance table was constructed for one subject category group in accord with the model developed in the lexicon outline as presented in Section III. By means of this table the selected descriptors were related to each other and to the Intermediate Lexicon.

ANALYSIS

The fourteen authority files reviewed for this research yielded a total of 5852 descriptors according to the previously stated methodology for selection. By treating those descriptors which occurred in more than one list as a single descriptor or unit, 3002 unique or discrete descriptors were identified.

Table 1 indicates those terms which were essentially eliminated from further investigation. Terms that were accommodated elsewhere in the Intermediate Lexicon were appropriately accumulated under headings provided in the Lexicon outline. Those additional headings are: peripheral disciplines -- Category B; languages -- Category C; localities -- Category D; and chronological frames or time periods -- Category E. The Annexes accommodate individual names, proper names and titles: Annex I - Persons; Annex II - Organizations; Annex III - Systems; Annex IV - Organizations; and Annex V - Publications. A small number of terms, approximately 10% of the total, were rejected on the basis that they would not function as index terms in the exchange of information between information science/documentation oriented organizations. These terms were of two types:

- Terms that cannot stand alone but must be used as part of a compound concept.

Activity	Acceptable	Automatic
Appraisal	Informal	Implicit
- Terms that are acceptable only in the local context of the vocabulary in which they are used.

Absence	Agreement
Allusions	

The rationale for excluding such terms is that it was not the objective of this research to transfer every term from all lists into list L₀ (the Intermediate Lexicon) so that L₀ would become an aggregate of all source lists. The result of such an exercise would clearly be no more than a random collection of terms and, rather than extend the Lexicon, would instead, destroy its validity.

Extension of the Intermediate Lexicon

Of 3002 discrete terms reviewed, 2344 terms remained after excluding terms of the type described above. These terms have been assigned to the 25 groups of the Intermediate Lexicon on the basis of the explicit definitions provided for each subject group in the Intermediate Lexicon. Tables in Appendix A contain the terms in their designated groups 1-25.

Table 1. The number of terms and percentage of total terms deleted from further processing by assignment to Lexicon categories and annexes or rejection.

OTHER SECTIONS OF LEXICON		NUMBER OF TERMS	% OF TOTAL TERM
Categories			
	B	119	3.96
	C	17	.56
	D	28	.93
	E	3	.09
Annex	I	4	.13
	II	59	1.97
	III	83	2.76
	IV	3	.09
	V	28	.93
Rejected		<u>314</u>	<u>10.46</u>
		658	21.91

An inspection of these tables in Appendix A reveals that the descriptors subsumed under each category do present a realistic corpus of terms which would prove useful in further efforts to extend the Intermediate Lexicon. Semantic and generic problems are readily apparent, however. Synonyms, near-synonyms and equivalents occur repeatedly, particularly in the more detailed categories. In addition numerous levels of generic and specific terms occur, without all levels being delineated. For example, in Table XVI, Classification and Indexing, a broad generic term (T) occurs, i.e. Classification; a generic intension of this term (T') also occurs, i.e. Classification systems; further intensions or specific terms (T'') also occur, e.g. Bliss classification, Brussels classification, Colon classification, Decimal classification, etc. It is unrealistic to expect that any group of all T'' are fully enumerated, given that the descriptor lists reflect only the environments for which they were developed. It is also apparent that not all possible T, T', or T''s occur; a T'', a specific level descriptor, may occur in one authority list, an appropriate T (broad generic term) may occur in the same and other authority lists, but no list may present an appropriate T' (a more circumscribed generic term). Thus, the base for extending the Lexicon is not wholly exhaustive and requires not only additional inputs from related indexing schemes but also requires intervention representing the consensus of qualified experts.

As predicted, additional semantic problems occur in relation to the generic problem. Terms which might be viewed as a "T'"" (an intension of specific level terms) occur, in some lists. For example, Dewey Decimal Classification in Table XVI is, in one respect, an intension or more specific term of Decimal Classification (T''). An alternate viewpoint might consider the term Dewey Decimal Classification to be, in reality a more desirable synonym, and it is thus designated as a postable term. A meta-language intended to effect convertibility between systems cannot arbitrate this type of generic/semantic problem but must accommodate both viewpoints. However, as the descriptors displayed in the 25 subject groups cannot be assumed to be wholly exhaustive, neither can it be assumed that all viewpoints demonstrating synonymy are represented in the descriptor lists reviewed. Thus, although this research has produced a substantial base from which the Lexicon may be extended, it is clear that the Intermediate Lexicon must continue to accommodate inputs of synonyms reflecting organizational viewpoint at future stages of development and must extend the techniques for utilizing these terms in system-to-system conversion efforts.

Universality and Autonomy

The universality and autonomy of the subject categories defined in the Intermediate Lexicon may be measured to an extent by the ability of the Lexicon to accommodate descriptors from the various authority files and by the degree in which terms can unequivocally be assigned to the appropriate subject groups. Table 2 indicates the number of descriptors

Table 2. The number of terms assigned to the subject groups of the intermediate Lexicon.

<u>SUBJECT GROUP</u>	<u>NUMBER OF TERMS</u>	<u>% OF TOTAL TERMS</u>	<u>NUMBER OF TERMS DUPLICATED</u>
1	17	.57	8
2	106	3.53	7
3	40	1.33	14
4	218	7.26	45
5	68	2.27	3
6	45	1.50	23
7	100	3.33	23
8	269	8.96	24
9	63	2.10	7
10	143	4.76	5
11	39	1.30	9
12	45	1.50	3
13	88	2.93	59
14	32	1.07	11
15	13	.43	2
16	297	9.89	98
17	29	.97	2
18	22	.73	6
19	84	2.80	3
20	163	5.43	3
21	112	3.73	4
22	47	1.57	20
23	240	7.99	25
24	55	1.83	4
25	<u>9</u>	<u>.30</u>	<u>3</u>
TOTAL	2,344	78.08	411

Table 3. Largest subject groups
ranked by number of terms.

<u>SUBJECT GROUP NUMBER</u>	<u>SUBJECT GROUP NAME</u>	<u>NUMBER OF TERMS</u>	<u>% OF TOTAL TERMS</u>	<u>DUPLICATED</u>
16	Classification and Indexing	297	9.89	98
8	Documentary Materials	269	8.96	24
23	Equipment and Software	240	7.99	25
4	Fringe Techniques and Science	218	7.26	45
20	Input and Storage	153	5.43	3
10	STINFO Processing: General	143	4.76	5
21	File Exploitation	112	3.73	4
2	Personnel	106	3.53	7
7	Organizations: Functioning	<u>100</u>	<u>3.33</u>	<u>23</u>
	TOTALS	1648	54.88	234

which were assigned to the 25 Subject groups delineated in the Intermediate Lexicon, the percentage of total terms ascribed to each Subject group, and the number of terms which might appear in the given Subject group but are also ascribed to another Subject group or groups.

The premise that the property of universality is properly ascribed to the Intermediate Lexicon is supported by the evidence that 78.08 percent of the total descriptors were attributed to the Subject groups and 11.45 percent of the total terms were assigned to other categories or annexes of the Lexicon. (See Table 1). It is significant that approximately 55 percent of the terms occur in nine of the 25 Subject groups. Table 3 presents these groups in descending order of the number of descriptors ascribed to the groups. These Subject groups appear to be those which are central to the discipline and which exact greater attention in both the literature and the application of the discipline. It should be noted that the four Subject groups which had the higher number of terms were among those groups which had the greater number of duplicated terms.

The demonstration of the quality of autonomy is affected by the following factors: the relative fluidity of meaning in the language of discourse of information science/documentation due to the multi disciplinary origins of the terms; the method of extracting the terms from the various lists to an extent stripped the terms of certain semantic precision which was either implicit or explicit with the arrangement of the term in the structure of the indexing language; and finally the nature of the field of information science/documentation requires that Lexicon allow for terms representing both things and processes to be entered in multiple subject groups despite the precision of the definitions presented for each subject group. This latter factor markedly affects a limited number of groups. For example Subject group 16, Classification and Indexing presents key-word-in-context indexing as an indexing technique although the definition for Subject group 17, Extraction clearly states that this indexing product belongs in this category. The duplication of entries of 411 terms indicate that this problem was encountered with sufficient frequency to question the autonomy of the subject groups. In some cases the decision to enter a term in multiple subject groups was arbitrary, exceeding the constraints imposed by the definitions for each group, but deemed meritorious in serving to extend the specific concepts of a given group. As this problem was encountered in a limited number of groups, it is expected that need for duplication of terms will not necessarily challenge the definitive exclusiveness of the subject groups. Rather, the findings warrant further investigation into extending the inclusiveness of subject groups and developing procedures for processing multiple entry concepts in effecting system-to-system convertibility.

Developing the Explicit Hierarchy

The approach to conversion from lists l_1 to l_n into l_0 while simultaneously constructing l_0 i.e. making the hierarchy of the Intermediate Lexicon explicit has been demonstrated by a selection of significant terms from Group XVI, Classification and Indexing. This group was chosen because it is central to the discipline as evidenced by the number of terms assigned and should contain few if any concepts that are not essential to scientific and technical information.

In Appendix B, examples are presented of the concordance table as it may be used to develop the explicit hierarchy of the subject group. In these examples, which are not exhaustive of the subject groups itself, emphasis is placed on classification and indexing. Where possible T' , the broad generic concept which makes up a subset of the subject group, and its equivalences are indicated as the first term (terms) in the content of the table. In those cases where T' was not presented in a list, it was provided to assist in extending the Lexicon.

Each of these terms, T' represents the number of discrete concepts which l_0 must accommodate, a relatively small number. The frequency of their appearance in the resource lists shows that these concepts are quite uniform in classification, but more diverse in indexing. This is not unexpected; comprehensive classification has been formalized by convention and is represented by a limited number of well-established systems. Specialized classification schemes are not common and there do not appear to be any terms in the Group that reflect only local use.

It is also clear that the generic concept classification can be divided into systems, elements and methods. Each of these in turn becomes generic to a set of specific terms which are largely enumerative. Thus we have:

Classification and Indexing (Group XVI)	
T	Classification
T'	Classifying
T'	Classification Systems
T"	Bliss Classification
T"	Brussels Classification
T"	Colon Classification
T"	Dewey Decimal Classification
T"	Library of Congress Classification
T"	Universal Decimal Classification

The generic concept of indexing provides, on the basis of the terms available in the lexical resources, essentially the same division as the concept of classification, i.e. types of indexes, systems, elements,

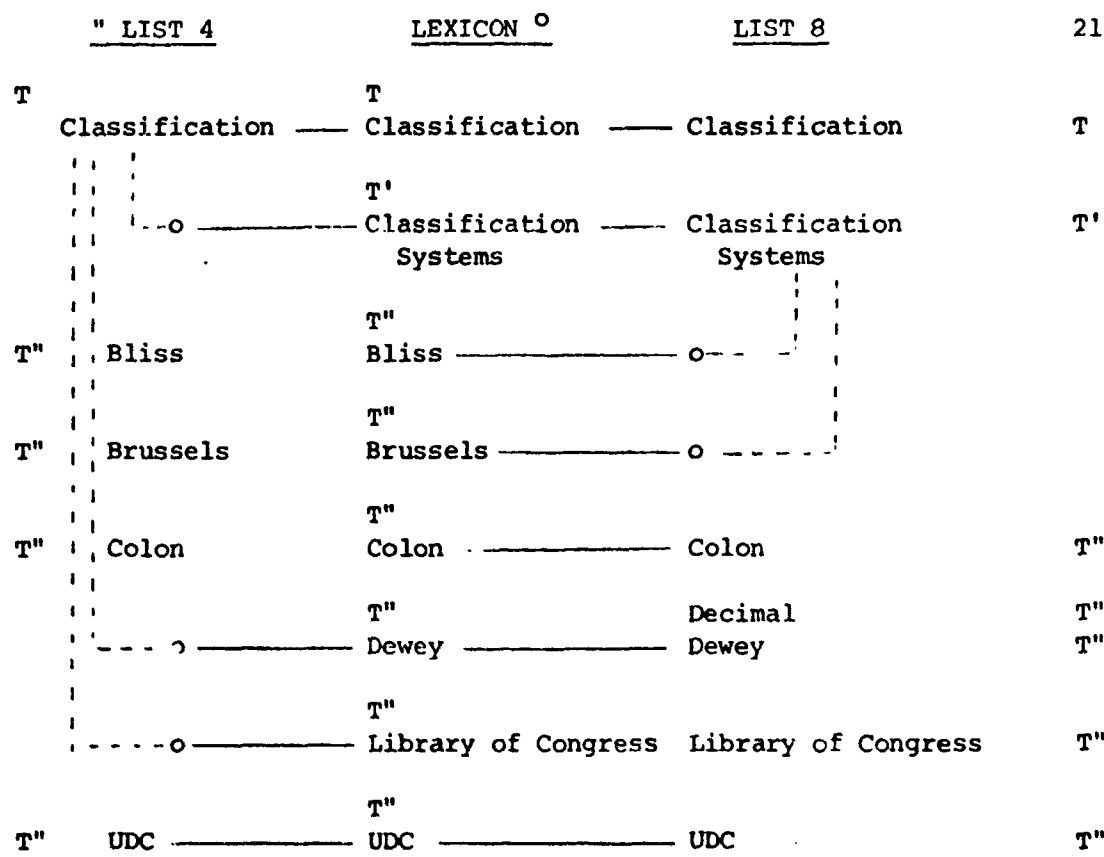
techniques. The diversity in the generic concept indexing is pronounced when the number of detailed terms, T", are observed under indexing techniques. Techniques are not as firmly establishing for indexing as they are for classification. The number of T" entries is three times as great as for classification techniques and a number of equivalent terms are encountered. Conversely the T" entries under Classification systems are more extensive than the T" entries under Indexing systems.

The obvious limitations in these examples are due to the viewpoint or bias of the lexical resources or authority files from which the terms were selected. Even when presenting with limited examples of the hierarchy made explicit through the application of the concordance, it is necessary to superimpose higher level terms of the T' level in order to obtain the balance requisite in an hierarchical display. It is not, however, the purpose of the Intermediate Lexicon to superimpose an arbitrary structure with which all other authority files used in effecting system-to-system convertibility must demonstrate a degree of conformity. In accepting this constraint in extending the Lexicon so that it possesses not only intension but structure, the most obvious solution is to propose (or propert) that the "missing links" will be supplied through the inclusion of more lists. This is, at best, a partial answer -- adequate perhaps for approaching the problem of developing "total enumeration". This proposed approach, as a research oriented approach, is doomed to only partial success since it assumes optimization of not only the Intermediate Lexicon but also the source lists. This ignores the constraints imposed on the Intermediate Lexicon as it actually functions in a realistic environment in effecting system-to-system conversion.

The conveniently available generic concepts in this section suggest that a well-ordered classification could be constructed from a collection of resource lists and produce a fair representation of the entire discipline. This would be true enough if the collection of resource lists were expanded to include those which scientific and technical information has cannibalized. There are very few autonomous concepts that exist only or originally within the discipline. The notion of information retrieval and its related terms may be all that remains when the rest are traced to the contributing discipline. The origin of these concepts is not presently of more than academic interest. They are the basis for the language of discourse in this domain and it is the assembled lexical resources that form the object of study.

It is immediately evident that the conversion will operate with advantage only in two respects: the one-for-one match and the transfer of specific to the proximate general level as shown in the example of Figure 1. Here list 8 inputs Dewey Decimal Classification and Library of Congress Classification, both specified in the Lexicon. List 4 can accept these terms as outputs only under Classification. This is appropriate, although not without difficulties, since neither Dewey nor

Figure 1. An example of conversion paths between two indexing system by way of the intermediate Lexicon.



Library of Congress has autonomous entry in List 4. In effect List 4 has a T, (Classification) and T", T" (Dewey, LC) without an appropriate T' (Classification systems). This has marked implications for List 8's ability to receive inputs from List 4. List 8, with the appropriate T' (Classification systems) and the specified T", T" (Dewey, LC) cannot received related input at the T" level, specifically Blidd and Brussels Classifications because these T", T" are subsumed under T' (Classification Systems) in List 8. Thus List 8 cannot receive from List 4 below the level of T (Classification). In short, except where a one-to-one ratio exists, when a T' is present in one list and not in another system to system convertibility cannot be adequately effected.

The underlying assumption here is that each list has and desires access to the Intermediate Lexicon only so that, in effect, potentially massive amounts of processing are performed according to the decision making algorithm, the Intermediate Lexicon, in order to achieve convertibility between the document stores on a cost/effective basis. The decision making functions can be amplified because each system clearly has an option of rejecting specific terms not used in its vocabulary or of converting by an equivalent to the proximate generic level. Electing to receive at the proximate generic level has the obvious disadvantage of introducing unspecified information into the receiving system when the receiving system desires specificity of the subsumed concepts.

We are left with the question: What will be the consequences in real applications? The problem seems clear in a research situation but the probability of this situation occurring with troublesome frequency could be minimal owing to the viewpoint or bias of the respective lists. It appears that specific T"'s, which in a given list lack a proximate generic level T', reflect a parochial interest of that user community. In that event, specific T"'s should not be converted to the supposedly proximate generic level without the express requirement to do so. Again, the likelihood of organizations with divergent viewpoints requiring total convertibility between document stores is open to question. The requirement is more likely to be for conversion of segments of a list, a requirement in which special conditions may be set for term inclusion and exclusion. This aspect does, however, violate the assumption that in the conversion process, a given list has no requirement to be concerned with the viewpoint of other lists. It seems prudent to suggest that any system receiving exchange through the Intermediate Lexicon should do so only with the full awareness of the impact that other system orientations will have on their own outputs.

APPENDIX A

GROUP I

Scientific & Technical Information in Social Context

<u>Term</u>	<u>List Code Numbers</u>											
Copyright (s) (6, 9)	X		X	X	X	X	X	X	X	X	X	X
Copyright Law (s) (6, 9)	X	X										
Crime												
Criminology												
Federal law (6)												
Government regulations												
History of documentation												
Increase of literature												
Information gathering (7)												
Information gathering, habits of S & T (%)												
Law (s)	X											
Legal questions in documentation (3, 6)												
Legislation (3)												
Propaganda (8)												
Publication Flood												

GROUP I - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Secret documents						X							X	
Social implications										X				

GROUP II

Personnel

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Abstractors		X			X										
Accreditation			X												
Analyst		X									X				
Analyst training											X				
Archivist										X			X		
Assistant librarian										X					
Association	X	X	X		X	X			X	X			X		
Awards	X									X					
Board of directors										X					
Career															
Computer assisted instruction															
Computer curriculum (4)		X							X						
Conference (s)		X	X		X				X		X		X		
Congress															
Consultant		X									X				

GROUP II - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Consulting			X												
Contractor (s)			X												
Contributions										X			X		
Convention			X							X					
Courses	X	X			X										
Course for documentalst												X			
Co-workers														X	
Curriculum (a) (4)	X	X	X							X					
Curriculum in info sciences		X													
Director										X					
Documentalist		X				X						X	X		
Documentalist training											X				
Dossier (s)						X							X		
Editors		X	X		X									X	
Education (s) (4)	X	X	X		X	X				X		X		X	
Education as training (4)									X						

GROUP II - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Education for librarians								X							
Education for information personnel		X													
Education, training (4)							X								
Employee			X												
Employee suggestions										X					
Employer			X												
Employment	X		X												
Engineer (s)		X								X	X				
Examinations															
Executive director										X					
Foreign library program										X					
Graduate curriculum										X					
Habit										X					
Human behavior		X													
In-service			X												
Indexers		X	X							X				X	

GROUP II - (Continued)

		<u>List Code Numbers</u>													
1	2	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Information personnel		X													
Information scientist (s)		X								X	X				
Information workers														X	
Instruction (4)		X	X						X						
Internship program										X					
Interpreter (s)		X									X		X		
Interviewer		X													
Job			X												
Job description										X					
Librarians		X	X							X	X	X	X		
Librarianship			X									X			
Library school (s)		X								X					
Linguist															
Linguist training											X				
Manager			X								X				
Manpower		X													
									X						

GROUP II - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Mathematician											X				
Meeting (s)	X	X	X	X	X	X			X	X					
On-the-job training		X	X												
Personal exchanges											X				
Personal file										X					
Personnel	X	X	X			X				X	X		X		
Personnel management (4, 5)													X		
Post-Graduate education	X														
Profession			X							X					
Professional associations											X				
Professional education for librarians & documentalists								X							
Professional groups													X		
Professional organizations	X														
Professional societies		X							X	X					
Professionals										X					
Programmer		X	X							X	X		X		

GROUP II - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Psychologists		X													
Publisher (s)		X	X		X					X			X		
Qualifications										X					
Recruiting															
Research associates program															
Researcher										X					
Science information specialists		X													
Scientific organization		X													
Seminars		X								X			X		
Societies															
Special librarian															
Staff		X	X				X	X						X	
Staffing										X					
Students		X								X					
Subject specialists										X					
Syllabus									X	X		X			

GROUP II - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Teachers										X					
Teaching for documentalists												X			
Teaching institutions											X				
Teaching methods										X					
Teaching organizations											X				
Technician			X												
Training		X	X		X					X			X		
Training courses														X	
Translator (s)		X	X			X									
University & college education	X										X	X	X		
User (s)	X	X	X		X	X			X	X	X	X	X	X	

GROUP III

Scientific & Technical Information Processing as a Science

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Artificial behavior											X				
Automation (4)		X	X		X	X		X	X	X	X	X	X		
Communication (4)	X	X	X			X	X	X	X	X		X	X	X	
Communication of information		X													
Communications (4)					X					X				X	
Creative		X													
Creative behavior										X					
Creativity			X	X					X						
Documentary research												X			
Documentation		X	X		X	X	X		X	X	X	X			
Documentation activities														X	
Documentation journal (8)														X	
Experiment (s) (4)			X							X				X	
Experimental (4)			X												
Experimental design															

GROUP III - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Experimentation									X					
Experimentation & evaluation				X										
Factual information		X								X				
Graphic data		X												
Graphic information		X												
Information	X	X	X		X				X			X		
Information features														X
Information science (s)	X	X	X			X		X	X	X	X		X	
Information system (s)		X								X		X	X	
Information theory (4)		X			X					X		X	X	X
International documentation (6)		X												
Kinds of information														X
Legal questions on documentation													X	
Library science	X	X								X			X	
Man-machine communication (4)		X									X			
Man-machine interactions (4)	X			X										

GROUP III - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Network & switching theory (6)				X										
Philosophy of documentation													X	
Redundancy	X		X		X				X	X				
Science of science														X
Scientific communication (10)		X												
Systematization of information														X
Technology (4)				X						X				
Theory		X	X	X		X			X	X				
Transmission (10)	X	X	X						X		X			

GROUP IV

Fringe Techniques & Sciences

Term

List Code Numbers

	1	3	4	5	8	13	14	15	18	19	20	21	23	TOTAL
Academic organizations	X													
Academy									X					
Access time											X	X	X	
Accounting	X	X	X											
Adaptive learning					X									
Add			X											
Address (es)		X	X		X			X			X	X	X	
Addressing										X				
Advance			X											
Algebra	X	X	X					X		X				
Algebraic									X					
Algorithmic analysis														
Algorithm		X	X		X			X	X	X	X			
Allocation			X											
Amphibolous			X											

GROUP IV - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Answer (21)			X		X				X						
Arithmetic			X												
Artificial intelligence (3)		X		X	X				X	X	X				
Associative memory		X								X	X				
Attributes			X			X			X						
Auto-instruction		X													
Automata	X	X	X						X				X		
Automata theory				X											
Automated teaching		X													
Automatic control systems				X											
Automatic data processing		X										X			
Automatic processing (12)		X													
Automation (3)		X	X		X	X		X	X	X	X	X	X	X	
Basic research		X													
Behavior	X	X	X												
Behavioral patterns															X
Biological research		X													

GROUP IV - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Biomedical research		X													
Calculus									X						
Chemical compounds	X	X								X					
Chemical research		X													
Chemical structure		X		X						X					
Communication (3)	X	X	X			X	X	X	X	X		X	X	X	
Communications (3)					X					X					
Composing	X	X	X												
Computation		X							X						
Computational linguistics		X													
Computer assisted instruction (2)									X						
Computer conferences (2)		X													
Computer curriculum (2)	X														
Computerized typesetting		X													
Concept formation (16)		X		X							X				
Construction (s)			X							X				X	

GROUP IV - (Continued)

Term	List Code Numbers															TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23		
Cryptography							X									
Curriculum (2)	X	X	X						X							
Custody			X													
Customer relations																
Cybertron	X	X	X		X	X	X		X	X	X	X	X			
Data center		X														
Data communication		X														
Data control		X														
Data transmission		X														
Decision-making	X	X		X		X				X						
Derivation			X													
Diagnostics										X						
Diagram (s)			X		X				X							
Digital systems				X												
Documentary research (3)												X				
Economic (s)	X	X	X						X	X					X	

GROUP IV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Economy			X										X		
Education (2)	X	X	X		X	X				X		X	X		
Electrical engineering		X										X			
Electronics	X	X				X				X		X			
Engineering	X	X	X			X			X	X			X		
Entropy										X					
Esparanto										X					
Education training (2)							X								
Education as training (2)									X						
Experiment (s) (3)			X							X				X	
Experimental (3)			X												
Experimental design (3)										X					
Experimentation (3)									X						
Experimentation & evaluation (3)					X										
Existing things														X	
Factor									X						

GROUP IV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Factor analysis (16)		X							X	X					
Finite automation											X				
Fonts		X													
Forecasts	X	X													
Formula (ae)		X			X										
Frequency analysis (16)										X					
Function (s)			X		X										
Game (s)		X	X			X			X		X		X		
Geography		X								X		X	X		
Government		X	X			X			X	X					
Graphic arts		X			X					X			X		
Hayward notation		X								X					
Helath sciences										X					
Heuristic (s)		X	X		X				X	X					
High-speed printing	X														
Holograms											X				

GROUP IV - (Continued)

Term	List Code Numbers															
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL	
Human communication		X	X	X												
Human engineering		X														
Humanities									X	X						
Hypothesis			X													
Identification of models (16)													X			
Ideographs (16)		X								X						
Induction			X													
Inductive									X							
Inductive inference				X												
Inductive logics				X												
Industry		X	X						X			X	X			
Inference									X							
Information theory		X			X					X		X	X	X		
Instruction (2)		X	X						X							
Intellect	X		X													
Intelligence		X	X			X										

GROUP IV - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Interlingua		X												
International language												X		
Journalism													X	
Knowledge		X	X		X								X	
Knowledge & learning							X							
Learn			X											
Learning	X	X	X		X				X	X	X		X	
Learning model										X				
Learning rate										X				
Learning theory		X			X									
Linguistic analysis		X									X			
Linguistic methods														
Linguistic models		X										X		
Linguistic problems		X												
Linguistic research		X												
Linguistic theories		X												

GROUP IV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Linguistics	X	X	X	X	X	X	X		X	X	X	X	X		
List processing		X							X	X					
Logic	X	X	X		X		X		X	X		X	X		
Machine systems (10)		X													
Man-machine communications (3)		X									X				
Man-machine interactions (3)	X			X											
Management	X	X	X			X		X	X	X			X		
Management decisions		X													
Management sciences										X					
Management techniques		X													
Math models		X			X						X				
Mathematical analysis		X													
Mathematical linguistics		X													
Mathematics	X	X				X			X	X	X	X	X	X	
Matrix (matrices)	X	X	X			X									
Memorization														X	

GROUP IV - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Microscopy (9)					X							X			
Organization	X	X	X		X	X			X		X	X	X		
Organization of science (10)								X							
Organizations	X									X	X		X		
Perception		X	X						X						
Personnel management (2)													X		
Philology					X								X		
Philology, linguistics, languages													X		
Phonetics					X						X				
Phonology			X								X				
Prices															
Probability	X		X						X						
Problem solving		X		X					X	X					
Programmed instruction		X		X					X						
Programmed learning		X													
Programmed teaching								X							

GROUP IV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Programmed texts (8)										X					
Psycholinguistics				X					X	X	X				
Psychology		X	X						X	X			X		
Publication, produced by machines								X				X			
Publish		X	X												
Publishing	X	X	X		X	X				X					
Quick reading					X										
Reading	X				X	X			X				X		
Recognition	X	X	X						X	X					
Recursive function											X				
Regression								X							
Reliability		X	X		X					X					
Research	X	X	X						X	X			X		
Research & development		X				X			X	X					
Early English		X			X				X						
Sampling			X							X					

GROUP IV - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Sampling techniques	X													
Scale			X											
Scaling			X											
Scaling techniques				X										
Science		X	X		X		X		X	X				
Scientific research		X												
Self-organizing system													X	
Semantic procedures (16)										X				
Semantic techniques (16)	X													
Semantics	X												X	
Simulation	X					X			X	X				
Simulation methods											X			
Speech	X	X	X		X				X				X	
Speech analysis	X													
Speech analysis, synthesis & recognition				X										

GROUP IV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Statistical analysis		X									X				
Stochastic (10)									X	X					
Structural linguistic				X											
Structural models (10)											X				
Syllabus									X	X		X			
Systematics					X										
Systems analysis		X													
Systems approach										X					
Systems design		X		X											
Taxonomic (16)			X												
Taxonomy (16)			X		X										
Teachers (2)										X					
Teaching institutions (2)											X				
Teaching methods (2)										X					
Teaching organizations (2)														X	
Technical communication (10)		X													

GROUP IV - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Technology				X						X					
Theory of language		X													
Theory of philosophy														X	
Thinking									X				X		
Thinking machines		X													
Thought		X	X												
Threaded list (16)									X						
Typography					X			X							
University & college education (2)	X														
Visual communication	X														
Voice communication		X													

GROUP V

Organizations: Internal Organizations of Individual Units

<u>Term</u>	<u>List Code Numbers</u>														
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Abstracting service (s)					X					X			X		
Academic library (ies)		X										X			
Bibliographic services		X											X		
Center			X						X						
Classification libraries													X		
Clearinghouse (s)		X	X			X							X		
Computer Center (s)		X								X					
Computing service											X				
Contracts		X	X		X					X					
Copying service (9)															
Data processing centers		X									X				
Decision model													X		
Depository (s)		X								X			X		
Depository libraries															
Distribution center															X

GROUP V - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Documentation center		X			X			X			X	X	X		
Elementary school library collection										X					
Engineering information centers		X													
Factory libraries - technical								X							
Hospital libraries								X							
Indexing services		X								X			X		
Information centers		X		X		X				X		X		X	
Information services		X			X			X		X			X	X	
Institution (s)											X		X		
Integration													X		
Intercommunication (7)											X				
Internal communication (7)		X													
Internal processing				X											
Law libraries									X						
Library (ies)	X	X	X		X	X			X	X	X	X	X	X	

GROUP V - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Library administration										X					
Library applications		X													
Library automation				X											
Library costs		X													
Library mechanization		X									X				
Library operation (s)		X								X					
Library organization											X				
Library service (s)		X								X					
Page charge		X	X												
Photocopying services													X		
Planning		X							X	X		X	X		
Processing service											X				
Processing service mechanization											X				
Public library										X					
Records management		X		X											
Reference centers		X													

GROUP V - (Continued)

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Reference libraries							X							
Reference service									X					
Referral service		X												
Reprint expenititing service									X					
Reproduction service (s)										X			X	
Research institute											X			
Research library (ies)		X						X		X				
Retrieval centers										X				
School library										X				
Scientific & technical libraries														X
Scientific information centers		X												
Scientific information service		X												
Scientific library												X		
Security classification		X			X									
Selective dissemination of information services					X									

GROUP V - (Continued)

<u>Term</u>	<u>List Code Numbers</u>																
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL		
Service (s)			X			X			X	X							
Special libraries		X					X	X		X							
Specialized information centers											X						
System			X			X			X	X	X		X				
Technical information centers		X															
Technical library (ies)		X						X				X					
Translation service (s)		X			X						X			X			

GROUP VI

Organizations & Organizational Networks: Structure

Term	<u>List of Numbers</u>														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Assistant librarian (2)										X					
Archivist (2)											X			X	
Administration (2)			X												
Board of Directors (2)										X					
Centralization (7)		X	X				X	X				X			
Centralized (7)										X					
Community (7)		X	X							X					
Contracts		X	X		X					X					
Cooperation	X		X						X	X			X		
Cooperative			X												
Cooperative acquisition project										X					
Decentralization (7)			X			X				X				X	
Decentralized (7)										X					
Delegation (2)										X					
Design of information systems (10)	X														

GROUP VI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Director (2)										X				
Documentation institute (2)												X		
Documentation systems (10)		X			X						X		X	
Employee (2)			X											
Employee suggestions (2)										X				
Employer (2)			X											
Employment (2)	X		X											
Executive director (2)										X				
Federal agency										X				
Federal government										X				
Federal law										X				
Federations													X	
Flexibility (10)										X				
Government regulations										X				
Information network		X												
Integration			X											X

GROUP VI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
International cooperation	X	X	X			X	X		X	X					
International documentation		X													
Law (s)	X		X		X	X	X		X	X			X		
Legal questions in documentation														X	
Legislation						X		X		X		X	X		
Library networks								X		X					
Manager (2)			X												
Network		X	X			X			X						
Network & switching theory				X											
Regional center										X					
Regional library system										X					
Structure (16)	X	X							X					X	
System			X			X			X	X	X			X	
Top management (2)	X														

GROUP VII

Organizations & Organizational Networks: Functioning

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Access (11)		X	X		X					X			X		
Acquisition coordinated								X							
Advertisements (8)										X					
Advertising		X								X					
Application	X	X	X		X	X			X	X			X		
Application of documentation to subject fields (10)													X		
Artificial behavior											X				
Budget	X	X								X					
Centralization		X	X				X	X				X			
Centralized										X					
Community		X	X							X					
Comparing (10)					X								X		
Comparison (10)			X						X	X	X		X		
Comprehensive												X			

GROUP VII - (Continued)

Term	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Control (10)	X	X	X						X				X	
Controlling (10)										X				
Conversion (10)	X	X	X	X	X				X	X	X		X	
Convertibility (10)	X	X	X											
Cooperation (6)	X		X						X	X			X	
Cost (s)		X	X						X	X		X	X	
Cost analysis & effectiveness			X											
Creative		X												
Creative behavior										X				
Creativity			X	X					X					
Data exchange		X												
Decentralization			X			X				X		X		
Decentralized										X				
Development of information systems (10)			X							X			X	
Direct exchange														X

GROUP VII - (Continued)

Term	<u>List Code Numbers</u>														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Distant exchange															X
Documentation services		X													
Documentation systems (10)		X			X					X	X		X		
Edit		X													
Editing		X	X		X	X			X	X	X	X			
Effectiveness (10)			X							X				X	
Efficiency (10)	X	X	X			X			X	X					
Elementary school library collection										X					
Equipment costs		X													
Evaluate (10)				X											
Exchange (s)	X	X			X	X				X	X				
Exchange of information													X		
Exchange of documents, information, etc.													X		
Exhibition										X		X		X	
Feasibility (10)	X		X			X				X					

GROUP VII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Feedback (10)	X	X	X		X	X			X	X				
Fees													X	
Finance (s)	X	X	X			X	X	X		X		X	X	
Financial support										X				
Flat printing													X	
Flow	X		X			X			X					
Flow charting (10)										X				
Foundations											X			
Funding										X				
Generating							X			X				
Generation		X	X						X					
Grant (s)		X	X					X		X				
Habit			X							X				
Human behavior		X												
Indexes cost		X												
Information exchange		X								X				

GROUP VII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Information gathering														X
Information gathering, habits of S & T				X										
Information needs		X			X									
Information needs of S & T				X										
Information processing economics (10)										X				
Information processing in information systems (10)													X	
Information requirements		X											X	
Interaction												X		
Interchange		X												
Intercommunication											X			
Interest profiles		X		X										
Interface			X						X					
Interlibrary loans		X												X
Internal communication		X												
International cooperation (6)	X	X	X			X	X		X					

GROUP VII - (Continued)

<u>Term</u>	<u>List Code Numbers</u>														
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Justification		X	X												
Justify			X												
Lending										X			X		
Library costs (5)		X													
Library loans													X		
Maintaining										X					
Maintenance		X				X									
Management information		X										X			
Management information systems		X													
Patterns of users										X					
Personal exchanges											X				
Personal file										X					
Precision					X					X					
Procedure (s) (10)			X							X					
Productivity			X											X	
Profile (s)	X	X	X												

GROUP VII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Publication costs		X												
Publication exchange										X				
Questionnaire (s)	X	X	X			X			X	X				
Questionnaire technique	X													
Referral			X											
Requirement (s)		X	X			X			X	X				
Salary (ies)	X						X			X			X	
Sources		X	X			X				X				
Specification (s)		X	X		X									
Survey		X	X			X		X		X				
Surveying	X													
System			X			X			X	X	X		X	
Use		X	X						X		X		X	
Use patterns										X				
User	X	X	X		X	X			X	X	X	X	X	X
User needs							X			X				

GROUP VII - (Continued)

<u>Term</u>	<u>List Code Numbers</u>														
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
User studies			X						X						
User requirements		X													
Utilization		X	X								X				

GROUP VIII

Document Materials

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Abridgement (14)			X		X								X		
Abstracts of documents	X														
Abstracts					X	X	X		X	X			X	X	
Abstracts publications	X														
Academic dissertations												X			
Accession list		X													
Advertisements										X					
Advertising literature	X														
Alphabetic subject catalogs							X								
Alphabetical catalogue												X			
Annals					X								X		
Annual Indexes					X										
Annual reviews										X					
Annual tables										X					
Anthology			X							X					

GROUP VIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Appendix			X												
Archival materials													X		
Archivist									X				X		
Article (s)		X	X		X				X	X		X	X		
Article, book											X				
Atlas		X									X				
Audiovisual documents															
Automatic compilation of data tables				X							X				
Auxiliary publication													X		
Availability (ll)		X	X			X			X				X		
Bibliographical lists															
Bibliographical products														X	
Bibliography (ies)	X	X	X		X	X			X	X	X	X	X	X	
Biographical documents	X														
Biographies					X		X	X		X			X		
Biological data, information	X														

GROUP VIII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Biological literature		X												
Biomedical literature		X	X							X				
Book (s)	X	X	X		X				X	X	X	X		
Book catalog		X								X				
Book review										X		X		
Books, periodicals													X	
Bulletins	X				X			X					X	
Business data		X												
Business information		X												
Card catalog		X			X								X	
Catalog (ue) (s)		X	X		X			X		X	X	X		
Catalog cards					X					X		X	X	
Chapters					X					X				
Chart (s)		X	X		X						X			
Checklists					X					X				
Chemical documentation (10)		X						X						

GROUP VIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Chemical information		X													
Chemical formulas											X				
Chemical literature		X													
Chemical patents		X													
Classified catalog						X						X			
Classified documents					X							X			
Compilations		X	X		X						X		X		
Completed titles					X										
Composite books													X		
Computer analysis of medical records (12)				X											
Computer controlled chart preparation				X											
Concordance (s)		X	X		X				X		X		X		
Conference papers					X										
Confidential documents														X	
Content (s)		X	X		X				X	X	X	X	X	X	

GROUP VIII - (Continued)

Term	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Content tables													X	
Critical data										X				
Critical reviews					X									
Critical tables		X												
Cumulation			X		X								X	
Cumulative book index										X				
Cumulative index (es) (16)		X			X					X			X	
Current awareness publication		X												
Data	X	X	X		X	X			X	X	X			
Data tables					X									
Data text										X				
Deposit copies													X	
Design (s)		X	X			X			X	X			X	
Dictionary of forms											X			
Digest (s)					X					X				
Directory		X	X		X				X	X			X	

GROUP VIII - (Continued)

Term

List Code Numbers

1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Dissertations	X			X				X	X			X		
Document	X	X						X	X		X			
Document aging											X			
Document card											X			
Documentation card											X			
Documentation general												X		
Documentation glossary										X				
Documentation journal											X			
Documents	X			X	X					X		X	X	
Draft														
Drawing (s)				X								X		
Edited text										X				
Editorial									X					
Encyclopedia														
Epistemic analysis of scientific literature (12)				X										
Errata														

GROUP VIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Exhibition (s)									X	X		X	X		
Exhibits														X	
Extract (s)		X	X		X	X			X	X					
Extracted articles													X		
Extraction										X					
Facsimile		X	X												
Factual information		X								X					
Fascides										X					
Figure documents													X		
Figures					X								X		
Firm papers													X		
Firms documentation					X										
Firms publications													X		
Footnotes					X										
Form		X	X										X		
Forms of document transformations														X	

GROUP VIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Formsheets					X										
Formula index		X													
Frequency			X			X			X	X					
Government publications		X								X					
Graph (s)	X		X	X					X		X				
Graphic (s)		X	X	X											
Graphic data (10)		X													
Graphic data documents											X				
Graphic data processing (10)		X													
Graphic information		X													
Guide (s)		X	X		X					X			X		
Guidebook										X					
Handbook (s)		X	X		X	X				X			X		
Handwritten documents														X	
Hard copy (9)					X										
Historical bibliography														X	

GROUP VIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Historical documents	X														
Holograms (4)									X						
House publications													X		
Humorous documents	X														
Illustration (s)			X		X		X						X		
Incunabula							X								
Index (es)	X	X	X			X			X		X	X	X		
Index of formula (16)												X			
Indexed text abstract											X				
Indexed text original											X				
Indexed text title											X				
Indexed texts											X				
Indexing reports		X								X			X		
Internal report (s)		X								X		X			
Journal (s)		X	X		X			X		X				X	
Journal articles		X													

GROUP VIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Journal publications		X													
Kinds of information														X	
Legal documents					X										
Letter (s)		X			X					X			X		
Library catalog		X													
Library of Congress card										X					
Linguistic bibliography & documentation							X								
List (s)		X	X		X				X	X		X			
List of titles											X				
Literary texts											X				
Literature		X	X		X				X	X			X		
Magazines					X										
Manuscript (s)			X		X					X	X		X		
Map (s)		X			X			X	X	X				X	
Medical information		X						X	X						
Medical literature		X													

GROUP VIII - (Continued)

Term	<u>List Code Numbers</u>														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Memoirs										X					
Memorandum					X										
Metallurgical literature		X													
Micro books (9)													X		
Micro reproduction (9)		X													
Microcard (9)		X			X					X	X	X	X		
Microfiche (9)		X	X		X					X	X	X	X		
Microforms (9)		X			X				X	X	X				
Minicard (9)			X						X			X	X		
Monographs					X					X			X		
Natural language text abstract											X				
Natural language text original											X				
Natural language text titles											X				
Natural language texts											X				
Newsletters					X					X					
Newspapers		X			X					X		X	X		

GROUP VIII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Non-textual data										X				
Non-written communications										X				
Numerical data		X			X									
Official publications											X			
Offprint (9)											X			
Page (s)		X			X					X				
Pamphlets					X		X							
Papers					X					X				
Parts & elements of documents (12)													X	
Patent (s)	X	X	X		X		X		X	X	X	X	X	X
Periodical (s)	X	X	X		X	X			X	X	X		X	
Photocopies (9)		X	X		X					X		X	X	
Photostat (9)		X												
Physics literature		X												
Preprint		X	X		X					X				
Prepublication					X									

GROUP VIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Presentation		X									X		X		
Primary documentation											X				
Primary journals		X			X										
Primary publication		X								X			X		
Primary sources														X	
Print out		X	X		X										
Proceedings (s)					X					X	X		X		
Programmed texts										X					
Progress reports					X				X	X		X			
Propaganda													X	X	X
Psychological literature		X													
Publication (s)	X	X	X		X				X	X	X	X	X		
Publishers catalogs															
Quality		X	X			X				X				X	
Quantity			X			X				X				X	
Receiving bibliographies										X					

GROUP VIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Reference data		X													
Report (s)		X	X		X				X	X			X		
Report abstract bulletin										X					
Report literature							X								
Report annual, several years								X							
Reprint (s)		X	X		X	X				X			X		
Research reports		X			X										
Resumes										X			X		
Review (s)		X	X		X			X	X	X			X		
Scatter (16)										X					
Science books										X					
Scientific information											X			X	
Scientific journals					X										
Scientific papers		X													
Scientific reports		X													
Scientific technical data		X													

GROUP VIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Scientific texts											X				
Scientific publications		X													
Secondary document												X			
Secondary documentation										X					
Secondary journals					X										
Secondary publication (s)		X								X			X		
Secondary sources														X	
Secret documents					X								X		
Serials		X			X					X			X		
Series								X							
Sources		X	X			X				X					
Specific bibliographies		X													
Specification (s)	X	X	X		X										
State of the art		X	X		X								X		
Statistical data (10)										X					
Studies			X											X	

GROUP VIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Study area										X					
Subject card			X												
Subject catalog								X		X		X			
Subject fields (16)					X								X		
Summary (ies)			X		X								X		
Supplements			X										X		
Symposium			X		X					X					
Synopsis			X												
Synthesis		X	X											X	
Table (s)			X		X								X		
Table of contents										X					
Tabledex (index)		X													
Technical reports		X									X				
Text (s)		X		X	X				X	X				X	
Textual		X													
Textual data														X	

GROUP VIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Thesis	X	X	X		X		X			X					
Time lags					X										
Title (s)		X	X		X				X	X	X	X	X		
Titles journal												X			
Titles lists					X										
Transparencies							X			X					
Type		X	X												
Types													X		
Types of documents													X		
Union catalog		X					X			X		X			
Union list		X			X					X					
Unpublished documents					X								X		
Vertical files													X		
Video file		X													
Video tape		X												X	

GROUP IX

Reprography

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Computer controlled printing				X											
Copies		X			X										
Copying		X	X												
Copying service (5)							X								
Copyright (s)		X		X	X	X	X	X	X			X	X		
Copyright law (s)	X	X								X					
Diapositives					X								X		
Diazoprinting													X		
Direct reproduction											X				
Document reproduction		X													
Documentary reproduction							X								
Duplicate (11)	X		X												
Duplicating							X							X	
Electrofax		X			X									X	
Electrography		X												X	

GROUP IX - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Electrostatic (s)		X													
Electrostatic processes	X														
Electrostatography		X													
Enlargement					X										
Fiche (s)				X	X										
Film (s)	X	X	X		X	X	X	X	X				X	X	
Flat printing													X		
Graphic (s)		X	X	X											
Hard copy					X										
Heat copying													X		
Hectography															
Helioprint														X	
High speed printing (4)		X													
Image (s)		X	X							X				X	
Indirect reproduction											X				
Micro image			X						X						

GROUP IX - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Micro reproduction		X												
Micro books													X	
Microcard		X			X					X	X	X	X	
Microcopy					X							X		
Microfiche		X	X		X					X	X	X	X	
Microforms		X			X				X	X	X			
Microphotography		X			X					X				
Microreproduction					X								X	
Minicard			X						X			X	X	
Non-phototechnical reproduction													X	
Offprint													X	
Offset										X			X	
Photo composition		X			X				X					
Photo-reproduction		X												
Photo-typesetting		X												
Photocopies		X	X		X					X		X	X	

GROUP IX - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Photocopying services (5)													X	
Photoelectric reproduction													X	
Photographic copying							X							
Photoreproduction					X				X				X	
Photostat		X												
Phototechnical reproduction													X	
Print		X	X									X		
Print out (8)		X	X		X									
Printing	X	X	X		X		X		X	X			X	
Reproduction (s)	X	X	X		X	X					X			
Reproduction service (s) (5)											X		X	
Reprography					X			X		X			X	X
Thermic copying													X	
Thermography		X											X	
Typography (4)								X						
Xerography		X			X				X	X		X	X	

GROUP X

Scientific & Technical Information Processing: General

Term	<u>List Code Numbers</u>														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Accession list (8)		X													
Application	X	X	X		X	X			X	X			X		
Application of documentation to subject fields													X		
Basic elements of documentation													X		
Biological data, information		X													
Chemical documentation		X													
Chemical formulae											X				
Chemical information		X													
Collate															
Collating	X	X			X										
Collation										X					
Collection, storage, retrieval													X		
Comparing					X								X		
Comparison													X		
Compounds													X		

GROUP X - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Computer methods									X						
Computer techniques		X													
Computing techniques														X	
Constituent									X						
Content (s)		X	X		X				X	X	X	X			
Context		X	X												
Control	X	X	X						X				X		
Controlling										X					
Conversion	X	X	X		X				X	X	X		X		
Convertibility	X	X	X												
Data handling		X													
Data processing	X	X			X	X	X		X			X			
Data processing system theory				X											
Data reduction		X		X											
Design of information systems		X													
Development of information systems			X							X			X		

CORUP X - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Digital data communication				X											
Display systems		X													
Displaying										X					
Document control		X													
Document processing													X		
Document representation				X											
Document card												X			
Documentary survey												X			
Documentation card												X			
Documentation center (5)		X			X			X			X	X	X		
Documentation efficiency												X			
Documentation methodology											X				
Documentation methods													X		
Documentation of documentation														X	
Documentation research		X												X	
Documentation theory (13)		X												X	

GROUP X - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Edit		X													
Editing		X	X		X	X			X	X	X	X			
Editors (2)		X	X		X								X		
Effectiveness			X							X			X		
Efficiency	X	X	X			X			X	X					
Evaluate			X												
Factual information		X								X					
Feasibility	X		X			X				X					
Feedback	X	X	X		X	X			X	X					
Flexibility										X					
Flow charting										X					
Frequency				X		X			X	X					
Generalities														X	
Graphic data		X													
Graphic data processing		X													
Graphic information		X													

GROUP X - (Continued)

<u>Term</u>	<u>List Code Numbers</u>														<u>TOTAL</u>
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Growth	X	X	X												
High use									X						
Informatics (4)								X		X					
Information management		X													
Information processes														X	
Information processing		X			X								X	X	
Information processing in information systems													X		
Information processing techniques		X													
Information processing economics											X				
Information technology		X	X					X							
Internal processing					X										
Investigation			X							X					
Levels of documentation													X		
Machine systems		X											X		
Maintaining										X					
Maintenance		X												X	

GROUP X - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Management information		X										X			
Management information systems		X													
Manual output														X	
Measurement		X	X						X						
Medical information		X													
Method (s)			X							X	X	X	X		
Model (s)	X	X	X						X						
Non numerical data processing				X											
Optimization					X				X	X					
Oral communications	X				X										
Organization of documentation													X		
Organization of information											X			X	
Organization of science								X							
Output		X	X		X	X			X		X	X	X	X	
Precision					X					X					
Prediction			X			X			X	X					

GROUP X - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Procedure (s)			X							X					
Process			X						X						
Processing		X	X						X	X					
Processing of documents & information													X		
Property (ies)			X						X				X		
Punched-card applications		X													
Punched-card methods		X													
Punched-tape information system												X			
Merging										X					
Quality		X	X			X				X			X		
Quantity			X			X				X				X	
Redundancy	X		X		X				X	X					
Registry systems										X					
Resource (s)	X	X	X			X				X					
Revising										X					
Revision (s)	X				X					X					

GROUP X - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Science & technology	X					X								
Science & technical research												X		
Scientific & technical documentation														X
Scientific communication		X												
Scientific documentation												X		
Scientific information										X				X
Scope			X		X									
Secondary documentation										X				
Set (s)			X						X					
Specification (s)	X	X	X		X									
Statistical data										X				
Statistical model											X			
Stochastic									X	X				
Structural models											X			
Study area										X				
Subject		X	X						X					

GROUP X - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Synthesis		X	X											X	
System			X			X			X	X	X		X		
Table (s)			X		X								X		
Tabulate			X												
Tabulating			X										X		
Technical bibliography & documentation	X		X												
Technical communication		X													
Technical documentation												X			
Technique (s)	X	X	X			X									
Textual		X													
Textual data											X				
Time duration										X					
Time lags					X										
Timeliness										X					
Transmission	X	X	X						X		X				
Viewpoint (s)		X												X	

GROUP XI

Collection of Information

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Access (4)		X	X		X					X				X	
Accessing (4)	X														
Accession (s)		X	X		X										
Acquisition	X	X	X		X	X	X	X	X	X	X	X		X	
Acquisition coordinated								X							
Automated selection												X			
Availability		X	X			X				X				X	
Collection	X	X		X						X	X	X		X	
Cooperative acquisition project (6)										X					
Coverage										X					
Data acquisition		X													
Data collection		X													
Document collections		X													
Duplicate	X														

GROUP XI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Duplicate sources														X
Duplications		X	X						X	X			X	
Holdings										X				
Information gathering (7)														X
Information gathering, habits of S & T (7)				X										
Information resources		X												X
Information source (s)		X			X							X		X
Integration			X										X	
Interlibrary loans (7)		X											X	
Interpreting (12)									X				X	
Range														
Reserve collection										X				
Scatter (16)										X				
Screening		X			X					X				
Select			X											
Select documentation												X		

GROUP XI - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Selecting		X								X					
Selection	X				X	X	X					X	X		
Selection aid (22)										X					
Selection of information														X	
Selection systems												X			
Selectivity			X		X					X					
Selector (s)		X			X										
Special collections														X	
Subject coverage															

GROUP XII

Information Analysis for Retrieval: General

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Analysis		X	X		X	X			X	X			X	
Analyst											X			
Analyst training											X			
Analyzing	X									X				
Attributes			X		X				X					
Automatic analysis		X												
Automatic compilation of data tables				X										
Automatic processing		X												
Bibliographic services (5)		X											X	
Characteristic (s)					X	X				X				
Column								X						
Compile		X												
Compiling					X					X				
Computation		X							X					

GROUP XIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Computer analysis of medical records				X											
Consistency		X							X	X					
Content (s)		X	X		X				X	X	X	X	X		
Content analysis				X	X									X	
Context		X	X												
Course for documentalists												X			
Criteria	X		X						X						
Criterion										X					
Criterion tree										X					
Data reduction		X		X											
Density			X							X					
Dependence									X						
Depth			X						X	X				X	
Document analysis					X										
Documentalist		X			X							X	X		
Documentalist training											X				

GROUP XII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	16	19	20	21	23
Documentation analysis											X			
Documentation theory (13)		X											X	
Epistemic analysis of scientific literature				X										
Error (s)		X	X		X	X			X	X			X	
Error detection & correction	X													
Gap			X						X					
Grouping of documents (13)									X					
Interpretation		X												
Parts & elements of documents													X	
Pattern (s)		X	X		X				X	X			X	
Range			X											
Scan			X											
Scanning					X				X					
Update						X								
Updating		X			X				X	X				

GROUP XIII

Cataloging

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Access (10)		X	X		X				X				X		
Added entried					X										
Alphabetic subject catalogs (8)							X								
Alphabetical catalogue												X			
Alphabetical indexing (16)		X													
Anglo American Rules										X					
Annotation (14)			X									X			
Annual indexes (8)					X										
Asyndetic (16)			X												
Antonyms (16)			X						X						
Bibliographic control										X			X		
Bibliographic control & organization		X													
Bibliographic data					X					X				X	
Bibliographic information		X													

GROUP XIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Bibliographical identification													X		
Bibliographical lists (8)														X	
Bibliographical products (8)														X	
Bibliographical research												X			
Bibliography files (8)	X	X	X		X	X			X	X	X	X	X	X	
Bibliology					X			X				X			
Book catalog (8)		X								X					
Card catalog (8)		X			X								X		
Catalog (ue) (s) (8)		X	X		X			X		X	X				
Catalog cards (8)					X					X		X	X		
Cataloging		X			X	X	X	X	X	X	X				
Cataloging process		X													
Catchwords (16)					X										
Checklists (8)					X					X					
Citation (s)	X	X	X		X	X			X	X		X		X	
Classified catalog (8)						X								X	

GROUP XIII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Content tables (8)													X	
Coupling (16)			X		X	X			X					
Cross index (16)		X												
Cross reference (16)		X			X					X				
Cumulative			X											
Cumulative book index (8)										X				
Cumulative index (es) (16)		X			X					X			X	
Current awareness publication (8)		X												
Deep indexing (16)		X			X									
Descriptive cataloging					X			X						
Descriptive			X											
Designations (16)													X	
Document card												X		
Document recording												X		
Document representation (10)				X										
Documentation card													X	

GROUP XIII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Documentation theory		X											X	
Entry (ies)			X		X					X				
Grouping of documents									X					
Heading (s) (16)			X		X				X				X	
Homographs (16)									X					
Homonymy (16)		X	X											
Homonyms (16)			X											
Identification		X	X											
Identify			X											
Identifying					X					X				
Index (es) (8)	X	X	X			X			X		X	X	X	
Index entries (16)					X								X	
Index evaluation (16)											X			
Index term (16)										X				
Indexed representation compatibility (16)											X			
Key terms (16)		X			X									

GROUP XIII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Library catalog (8)		X												
Library of Congress card (8)									X					
List of titles (8)											X			
Main entry (ies) (16)					X									
Order (16)			X		X								X	
Pseudonyms					X									
Publishers catalogs (8)								X						
Reference numbers					X									
Referral (7)			X											
Scan (12)			X											
See reference (16)					X					X				
See also reference (s) (16)					X					X				
Specific bibliographies (8)		X												
Structure (16)		X	X											X
Subject card (8)			X											
Subject catalog (8)								X		X		X		

GROUP XIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Subject cataloging (16)				X											
Subject heading (s) (16)		X		X	X					X			X		
Syndetic headings (16)					X										
Table of contents (8)										X					
Technical bibliography & documentation (10)	X		X												
Tracing					X										
Union catalog (8)		X					X			X		X			
Union list (8)		X			X					X					
Use references (16)					X										
Vertical files													X		

GROUP XIV

Abstracting & Annotating

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Abridgement			X		X								X	
Abstract Charges		X												
Abstract evaluation										X				
Abstract journal coverage										X				
Abstracting	X	X		X	X	X	X		X	X			X	
Abstracting costs		X												
Abstracting service (s) (5)					X					X			X	
Abstracting system		X												
Abstracting training course		X												
Abstractors		X			X								X	
Abstracts (8)					X	X	X		X	X			X	X
Abstracts of documents (8)	X													
Abstracts publications (8)	X													
Annotation			X									X		
Book review (8)										X		X		

GROUP XIV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Condensation			X		X						X				
Condensing									X						
Indexed text abstract											X				
Indicative abstracts		X	X		X										
Informative abstracts		X			X										
Interpretation (12)		X													
Natural language text abstract (8)											X				
Natural language text titles											X				
Paraphrase									X	X					
Report abstract bulletin (8)										X					
Subject slanting in scientific abstracting				X				X							
Telegraphic									X						
Telegraphic abstract		X			X										
Time lags					X										
Update (12)						X									
Updating (12)		X			X				X	X					

GROUP XIV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Viewpoint (s) (10)		X													
													X		

GROUP XV

Writing Surveys of Document Content

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Abstract Journal (s)					X					X	X	X		
Abstract format		X												
Annual Reviews (8)										X				
Audience			X											
Book publishing								X						
Checklists (8)					X					Y				
Composition	X		X							X			X	
Document survey												X		
Introduction										X				
Punctuation									X	X				
Style				X					X	X				
Technical writing		X												
Writing	X	X	X			X			X	X				

GROUP XVI

Classification & Indexing

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Access (11)		X	X		X					X			X		
Added entered (13)					X										
Adjective (4)									X						
Adverb (4)									X						
Affixes (4)										X					
Alphabetic subject catalogs (8)							X								
Alphabetical catalogue												X			
Alphabetical classification												X			
Alphabetical indexing		X													
Analet (4)													X		
Analysis by compression & classification (12)													X		
Analytics-synthetic classification														X	
Anamorphet (4)										X					
Anastigmat (4)													X		

GROUP XVI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Annual Indexes (8)					X										
Antonyms (4)			X						X	X					
Aspect (s)		X	X		X								X		
Association factors		X													
Associative indexing		X		X											
Associative methods										X					
Asyndetic			X												
Bibliographic control & organization (13)		X													
Bibliographical lists (8)														X	
Bibliographical products (8)														X	
Bibliography (ies) (8)	X	X	X	X	X	X			X	X	X	X	X	X	
Bliss classification			X										X		
Book catalog (8)		X								X					
Brussels classification			X												
Card catalog (8)		X			X								X		
Catalog (ue) (s) (8)		X	X		X			X		X	X	X			

GROUP XVI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Catalog cards (8)					X				X	X		X	X		
Catchwords (4)					X										
Category (ies)		X	X		X				X	X			X		
Chain			X						X						
Chain index					X					X			X		
Checklists (8)					X					X					
Class		X	X		X								X		
Class thesaurus										X					
Classification		X	X	X	X	X	X	X	X		X	X	X		
Classification & organization of knowledge				X											
Classification elements													X		
Classification order													X		
Classification system (s)	X	X		X	X			X		X				X	
Classification theory		X		X	X										
Classified catalog (8)													X		
Classify			X											X	

GROUP XVI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Classifying									X						
Clump (20, 21)		X													
Clumping									X	X					
Clustering (21)					X				X						
Colon			X												
Colon classification		X			X				X				X		
Concept (s)	X	X	X		X	X			X	X			X		
Concept formation (s)		X		X							X				
Conceptions													X		
Conjunction (s) (4)					X										
Content tables (8)													X		
Context		X	X												
Cooccurrence									X						
Coordinate (21)			X						X						
Coordinate classification					X								X		
Coordinate index		X									X				

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Coordinate indexing	X			X	X	X	X			X				
Copulae (4)					X									
Correlation (s) (4)	X	X	X		X				X	X				
Correlation factors										X				
Cor relative			X											
Correlative index (es)		X											X	
Correspondence (8)	X	X	X							X				
Coupling			X		X	X			X					
Criterion tree (12)										X				
Cross in	X													
Cross reference	X				X					X				
Cumulative			X											
Cumulative book index (8)										X				
Cumulative index (es)	X				X					X			X	
Current awareness	X									X		X		
Current awareness publication (8)	X									X				

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	
Decimal classification (s)		X			X			X					X	
Deep indexing		X			X									
Dependence									X					
Depth (12)			X						X	X			X	
Descriptor (s)		X	X	X	X				X	X		X	X	
Designations													X	
Dewey decimal classification	X	X			X					X		X	X	
Display systems		X												
Displaying										X				
Division (s) (5)			X		X									
Document card												X		
Document representation (10)				X										
Documentary classification		X												
Documentation card												X		
Dual indexing					X									
Enumerative classifications													X	
Facet (s)			X		X				X					X

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Facet analysis		X												
Facet classification	X	X			X						X	X	X	
Faceted			X							X				
Factor analysis		X							X	X				
Filiatory					X									
Free terms					X									
Frequency analysis										X				
Frequency of assignment					X									
Gap			X						X					
Generic (s)		X	X		X				X	X				
Generic posting										X				
Gerund			X											
Grouping of documents (13)									X					
Heading (s)			X		X				X				X	
Hierarchic chain					X									
Hierarchical			X											X

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Hierarchical classification (s)					X								X	
Hierarchies							X							
Hierarchy			X		X	X	X		X					
Homographs									X					
Homonymy (4)		X	X											
Homonyms (4)			X											
Hospitality			X		X									
Identification (13)		X	X											
Identification of models													X	
Ideographs		X												
Image classification logic				X										
Index (es) (8)	X	X	X			X			X		X	X	X	
Index entries										X				X
Index evaluation										X				
Index of formula												X		
Index term													X	

GROUP XVI - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Indexed representation comparability											X				
Indexed text abstract										X					
Indexed text original										X					
Indexed text title										X					
Indexed texts										X					
Indexers (2)		X	X		X					X			X		
Indexing	X	X	X	X	X	X			X	X		X	X		
Indexing aids										X					
Indexing depth					X										
Indexing language (s)				X						X					
Indexing methods													X		
Indexing problems		X													
Indexing reports (8)		X								X			X		
Indexing services (5)		X								X			X		
Indexing system (s)		X		X						X					
Indexing techniques		X													

GROUP XVI - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Indexing term (s)					X										
Indexing terminology	X														
Indexing theories		X													
Indexing languages				X											
Information language (s)		X								X					
Information language compatability										X					
Information language comparison										X					
Interest profiles (7)		X		X											
Intermediate languages		X								X					
Interpretation (12)		X													
Inverted headings					X										
Inverted indexes													X		
Kernel									X						
Key terms		X			X										
Key word		X	X		X	X				X			X		
Key-word-in-Context indexing	X	X	X	X	X				X	X		X	X	X	

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Key terms					X									
Key word			X									X		
Keyword frequency					X									
Latent class										X				
Latent class analysis									X					
Library catalog (8)		X												
Library classification		X												
Library of Congress classification (system)	X				X									
Link (s)	X	X	X		X		X					X	X	
Link indicator										X				
Linking									X					
Links & roles						X								
List of titles (8)											X			
Main entry (ies)					X									
Modifier (s)			X		X						X		X	
Modulants (4)					X									X

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Morpheme (4)			X						X		X		X	
Morphology (4)		X	X								X			
Multi-aspect classifications													X	
Natural language text titles											X			
Nomenclature		X	X		X				X	X			X	
Notion (s)					X								X	
Notions correlations													X	
Noun (4)			X						X					
Order			X		X								X	
Parsing (4)			X						X	X				
Pattern (s) (12)		X	X		X				X	X			X	
Philological analysis (4)													X	
Phoneme (4)		X	X						X				X	
Phrases (4)			X						X				X	
Phrase structure (4)		X												
Polydecimal classification					X									

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Polyhierarchy					X									
Polyterms (4)					X									
Post													X	
Posting					X									
Precision					X					X				
Pre-coordinate indexes							X							
Predicate (4)									X					
Prefix (4)									X					
Preposition (4)									X					
Profile (s) (7)	X	X	X			X								
Probabilistic indexing		X												
Pronoun (4)				X										
Radical semantics (4)										X				
Rank					X									
Ranked									X					
Reclassification							X							

GROUP XVI - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Redundancy	X		X		X				X	X					
Relat term references									X						
Relatedness									X						
Relational grammar									X						
Relational indexing					X										
Relative index (es)													X		
Rider class													X		
Role (s)		X	X		X		X		X	X					
Role indicator (s)	X	X			X					X					
Roots (4)					X										
Rotation indexes													X		
Scan (12)			X												
Scan column			X						X						
Scan column index		X													
Scatter										X					
Scattering			X												

GROUP XVI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Schedule (s)			X		X										
Scheme			X												
Screening (11)	X				X					X					
See also reference (s)					X					X					
See reference					X					X					
Semanteme (s) (4)					X								X		
Semantic (4)										X					
Semantic analysis		X									X				
Semantic content		X													
Semantic procedures											X				
Semantic techniques		X													
Semantics (4)	X	X	X		X				X			X	X		
Sentence (s) (4, 15)	X	X	X		X	X			X	X			X	X	
Set (s)			X						X						
Source indexing	X														
Statistical methods - indexing							X								

GROUP XVI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Statistical phrase (4)										X					
Structerms (4)	X														
Structural linguistic				X											
Structure	X	X	X						X					X	
Subject analysis	X				X										
Subject card (8)			X												
Subject catalog (8)								X		X		X			
Subject cataloging				X											
Subject classification	X											X			
Subject entries					X										
Subject fields					X								X		
Subject heading (s)	X			X	X					X			X		
Subject index	X				X					X		X			
Subject indexing							X			X					
Suffix (es) (4)									X	X					
Syndetic headings					X										

GROUP XVI - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Synonymy (4)			X												
Synonyms (24)		X	X		X					X					
Syntactic (s) (4)		X	X						X	X					
Syntactic procedures (4)											X				
Syntax (4)	X	X	X		X	X			X			X	X		
Syntax analysis (4)													X		
Synthesis		X	X											X	
Table of contents (8)										X					
Tabledex (index) (6)		X													
Tagging					X										
Taxonomic															
Taxonomy															
Telegraphic (14)									X						
Telegraphic abstract (14)		X			X										
Term (s)		X	X		X				X	X				X	
Termatex		X	X						X					X	

GROUP XVI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Threaded list									X					
Titles list (8)					X									
Topic (s)			X		X									
Tree hierarchy										X				
Tree structure									X					
Types of indexes & other word lists													X	
UDC	X	X	X		X			X	X	X			X	
Union catalog (8)		X					X			X		X		
Union list (8)		X			X									
Uniterm (s)		X	X		X	X			X	X		X		
Uniterm index										X				
Uniterm indexing		X					X							
Uniterm systems	X													
Update (12)						X								
Updating (12)		X			X				X	X				
Use references					X									

GROUP XVI - (Continued)

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Verb (s) (4)		X	X						X					
Verb forms (4)										X				
Verbal (4)		X	X											
Verbal indexing					X									
Verification													X	
Vertical files													X	
Viewpoint (s) (10)		X											X	
Vowel (4)				X										
Weights												X		
Word list (s)		X			X									
Word pair or group														X

GROUP XVII

Index Making by Extracting Terms from Input

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Auto abstracts		X				X									
Automatic abstracting				X											
Automatic classification		X		X						X					
Automatic coding		X													
Automatic compilation of dictionaries				X											
Automatic indexing		X		X			X								
Citation index (es)	X				X					X	X	X	X		
Citation indexing		X		X			X			X					
Clue Words		X													
Connections												X			
Connective index												X			
Connectivity															
Edit		X													
Edited text (s)											X				

GROUP XVII - (Continued)

Term	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Editing		X	X		X	X			X	X	X	X		
Exclusions					X									
Extracting	X	X								X				
Identification (13)		X	X											
Machine abstracting													X	
Machine analysis													X	
Machine classification													X	
Machine indexing												X	X	
Mechanical abstracting													X	
Mechanical analysis					X								X	
Mechanical documentation					X			X						
Mechanical indexing								X					X	
Permutation	X		X			X			X	X	X		X	
Permutation index (es		X								X	X		X	
Semantic classification by machine				X										

GROUP XVIII

Translation

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Analysis by translation (12)													X		
Automatic language translation				X											
Automatic translation	X														
Cost of library materials service									X						
Cover-to-cover translation	X				X										
Cyrillic alphabet			X												
Interpretation (12)	X														
Interpreter (2)	X										X		X		
Language translation	X		X												
Linguist (2)											X				
Linguist training											X				
Machine translation	X						X					X	X		
Mechanical translation					X			X			X			X	
Mechanical translation tools											X				

GROUP XVIII - (Continued)

<u>Term</u>		<u>List Code Numbers</u>													
1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL	
Russian translation		X													
Translate			X												
Translating						X			X						
Translation (s)		X	X	X	X		X	X		X	X	X			
Translation algorithm		X													
Translation service(s) (5)		X			X					X			X		
Translator (2)		X	X						X		X	X			
Transliteration		X	X		X					X	X	X			

GROUP XIX

Codification

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Acronym			X						X	X					
Alpha															
Alpha-numeric		X													
Alphabet		X	X		X				X						
Alphabetic			X												
Alphabetical code (s)					X								X		
Alphabetical notations													X		
Alphabetical symbols													X		
Alphanumeric			X												
Alphanumerical codes					X										
Alphanumerical notations													X		
Analysis by notation & codification													X		
Binary		X	X												
Binary codes		X												X	

GROUP XIX - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Binary methods					X										
Call number									X						
Character		X	X		X				X				X		
Ciphers		X	X		X										
Code		X	X		X	X							X		
Code construction													X		
Coden periodical titles index										X					
Coden system					X										
Codification											X		X		
Coding	X	X	X		X				X	X	X	X			
Coding systems	X	X													
Coding systems & techniques				X											
Coding techniques		X													
Coding theory		X													
Column													X		
Decimal													X		

GROUP XIX - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Decimal codes													X		
Deciphering					X						X				
Decodification													X		
Decoding		X	X		X										
Deuce		X													
Digit			X												
Digital		X	X			X				X					
Digital data		X													
Dimensionality										X					
Dimensions of symbols													X		
Direct coding					X										
Enciphering					X										
Enc de			X												
Encoding		X	X		X										
Encoding information				X											
Errors - correcting code				X											

GROU XIX - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Fixed field coding					X										
Fixed format									X						
Format		X	X			X			X						
Formatting				X											
From code					X										
Generic codes					X										
Identification		X	X												
Ideographs (16)		X			X										
Indirect coding					X										
Linear notations		X													
Machine codification													X		
Notation		X	X		X				X				X		
Notation systems		X											X		
Number (s)		X	X		X	X									
Number system										X					
Numerals	X		X											X	

GROUP XIX - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Numeric codes		X			X								X	
Numerical notations													X	
Polydecimal codes													X	
Pseudo-code													X	
Publication, Produced by machine (4)								X						
Ramissyllabic notation													X	
Random code										X				
Random coding					X									
Roman numbers					X									
Script symbols													X	
Selection code (11)		X												
Semantic code (s)		X							X			X	X	
Serial numbers														
Special characters					X								X	
Structure code (s)		X											X	
Subject code		X												

GROUP XIX - (Continued)

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Symbol (s)		X			X	X	X		X				X	
Types of codes													X	
Symbols													X	
Typological codes													X	
Wiswesser notation		X								X				
Zatocoding		X	X		X				X			X		

GROUP XX

Input & StorageTermList Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Accession list (8)		X													
Alpha-matrix		X													
Arrangement		X	X		X										
Array			X		X										
Automatic character recognition		X													
Automatic input													X		
Automatic pattern recognition		X													
Automatic speech recognition		X													
Automatic storage													X		
Batch processing			X						X	X					
Binding	X	X	X							X			X		
Bound term			X												
Card files		X												X	
Card format, layout															

GROUP XX - (Continued)

Term	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	
Closed array					X									
Code conversion													X	
Cordonnier										X		X		
Cordonnier cards													X	
Core store (age)		X												
Data bank		X												
Data input		X												
Data storage		X												
Data storage & retrieval		X												
Direct files					X									
Disc		X								X				
Disk (s)					X						X			
Disk memory		X												
Disk storage					X									
Document storage		X												
Drum memory		X												

GROUP XX - (Continued)

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Drum store						X								
Edge notched card (s)	X	X			X			X		X		X	X	
Edge punched card (s)			X		X			X					X	
Edited text (8)											X			
External memory										X				
Ferroelectric & electrostatic stores													X	
Field punched cards					X									
File (s)		X	X		X				X	X	X		X	
File activity										X				
File cards					X								X	
File conversion				X										
File field										X		X		
File maintenance					X									
File organization	X	X		X							X			
File purging & updating				X										
File structure													X	

GROUP XX - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Filing	X	X	X		X					X		X			
Film cards									X						
Filmsort cards													X		
Graphic records	X														
Hand punched cards													X		
Hand sorted punched card files													X		
Hand sorted punched cards													X		
High density storage													X		
Hypertape		X													
Image storage techniques				X											
Index cards					X										
Index field											X				
Information storage		X			X			X				X		X	
Input		X	X	X	X	X			X		X	X	X	X	
Input data										X					
Input-output		X													

GROUP XX - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Internal memory										X					
Inverted		X	X												
Inverted file (s)		X			X					X					
Inverted filing system					X										
Keycards		X													
Keypunching									X				X		
Linear file										X					
Magnetic cards		X													
Magnetic core stores													X		
Magnetic disc (disks)		X			X										
Magnetic disk stores													X		
Magnetic drum		X													
Magnetic drum stores													X		
Magnetic memory		X													
Magnetic storage		X													
Magnetic stores														X	

GROUP XX - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Magnetic tape	X	X			X					X	X	X		
Magnetic tape records							X							
Magnetic tape system		X												
Manual files											X			
Manual input													X	
Manual storage & stores													X	
Marginal punched cards													X	
Marksensing cards													X	
Mass storage										X				
Matrix memories					X									
Memories													X	X
Memory (4)	X	X	X	X	X				X	X		X		
Memory storage		X												
Memory storage methods											X			
Memory systems		X												
Microfilm reader		X												

GROUP XX - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Microfilm (s)		X	X		X			X		X		X	X		
Microfilm records		X													
Microfilm storage		X													
Microfilm systems		X													
Minicard system (s)		X			X										
Notched cards													X		
Optical card										X					
Optical character recognition		X													
Optical coincidence	X	X				X	X								
Optical coincidence cards	X														
Paper tape	X	X			X				X	X			X		
Peek-a-Boo		X	X					X				X			
Peek-a-Boo cards		X			X				X					X	
Peek-a-Boo systems		X													
Photo-memory		X													
Photograph store information system												X			

GROUP XX - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Photographic files											X				
Photographic film		X													
Photographic storage					X										
Photomagnetic stores													X		
Photomicrography		X													
Photoscope disk											X				
Photoscopic memory		X													
Photostores														X	
Pre-punched files											X				
Punch card														X	
Punch tape											X				
Punched card (s)	X	X			X		X	X	X	X		X			
Punched documents														X	
Punched tape (s)		X			X							X	X	X	
Punching	X				X									X	
Random access		X			X				X	X					

GROUP XX - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Random access file		X												
Random access memory		X												
Random access storage		X												
Record (s)	X	X	X		X					X				
Recording media					X									
Semi-mechanical input													X	
Semi-mechanical storage													X	
Sensing													X	
Sequence			X		X									
Serial			X											
Serial records		X												
Slotted cards					X							X	X	
Slotting													X	
Sorting	X	X			X				X	X			X	
Source data automation				X						X				
Storage		X	X		X	X			X	X				X

GROUP XX - (Continued)

<u>Term</u>	<u>List Code Numbers</u>															
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL	
Storage & retrieval	X	X														
Storage capacity		X										X				
Storage media	X	X		X												
Storage methods		X														
Store			X									X	X			
Summary punching													X			
Superimposable cards					X											
Superimposed coding		X			X											
Superimposed coincidentally punched cards													X			
Tabulating cards	X															
Tape	X	X	X			X			X							
Tape storage		X														
Term card												X				
Termatex cards		X														
Termatex systems		X														
Threaded test structures				X												

GROUP XX - (Continued)

<u>Term</u>	<u>List Code Numbers</u>																		
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL				
Transaction card										X									
Uniterm cards													X						
Visual punched cards					X														
Weeding					X														

File Exploitation

[illegible]

GROUP XXI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Canonical form									X						
Coincidence	X		X		X										
Combinations													X		
Compatability	X	X				X			X		X				
Compatible			X												
Concept coordination		X			X										
Coordination	X	X	X		X	X				X		X	X		
Cranfield measures										X					
Data retrieval		X													
Decomposition			X												
Deductive			X												
Disjunction (s)			X		X										
Disjunctive			X												
Document retrieval		X		X											
Euler diagrams					X										
Exploitation		X													

GROUP XXI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Fact correlation									X					
Fact correlation & retrieval				X										
Fact retrieval				X										
False drop (s)		X			X								X	
False information										X				
Fast access information retrieval										X				
File search system		X												
Filesearch					X				X					
Gap			X						X					
Generic searches		X												
Hand-sorting information system (10)												X		
Hit (s)					X								X	
Information request												X		
Information retrieval		X			X							X		X
Information retrieval languages				X										
Information retrieval system			X	X										

GROUP XXI -- (Continued)

Term	List Code Numbers																						
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL								
Information search		X																					
Information storage & retrieval (20)		X		X																			
Inquiry (ies)		X	X		X							X	X										
Interrogation			X						X														
Iterative									X														
Iterative methods										X													
Lattice (s)	X		X						X														
Linear access					X																		
Literature retrieval		X																					
Literature search		X																					
Literature searching					X																		
Literature storage & retrieval		X																					
Logical operations												X											
Logical product					X					X													
Logical sum					X																		
Logical syntax														X									

GROUP XXI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Machine retrieval					X										
Manual search (s)					X										
Manual searching		X													
Math logic										X					
Mechanical search (s)					X								X		
Mechanized information retrieval							X								
Mechanized literature search		X													
Mechanized search system		X													
Natural language computer interrogation & instruction				X											
Noise		X	X		X				X	X					
Pertinence					X						X		X		
Query formation				X											
Query (ies)			X		X				X				X		
Question (s)		X	X		X				X				X		
Random searching										X					
Recall		X	X		X	X			X	X					

GROUP XXI - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Recall number												X		
Recovery			X											
Reference		X	X		X	X			X				X	
Reference ceids										X				
Reference retrieval		X												
Relevance		X	X			X			X	X			X	
Relevance assessment				X										
Relevant			X											
Remote access									X					
Request (s)		X	X			X								
Request terms										X				
Response (s)			X							X				
Response time										X				
Retrieval		X	X		X	X		X	X	X			X	
Retrieval methods		X												
Retrieval process		X												
Retrieval system (s)		X												

GROUP XXI - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Retrieval techniques		X													
Retrospective searching		X													
Scan			X												
Search		X	X			X									
Search criteria		X													
Search strategy		X			X					X			X		
Search time		X													
Searching	X		X		X		X		X	X					
Searching techniques		X													
Semi-mechanical search													X		
Sequential searching		X													
Seriality (4)										X					
Strategy			X						X						
Symbolic logic		X			X										
Tutology					X										
Time lags					X										

GROUP XXII

Dissemination

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Abstract Journal Coverage (14)											X				
Access (11)		X	X		X					X			X		
Announcement		X				X				X					
Annual Reviews (8)										X					
Circulation		X	X		X					X	X				
Circulation of books, periodicals													X		
Circulation research										X					
Circulation system										X					
Circulation time											X				
Copying service (9)												X			
Current awareness		X								X			X		
Current awareness publication (8)		X													
Current awareness service & systems		X		X	X										
Data Dissemination (22)		X													

GROUP XXII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Data exchange (7)		X													
Direct exchange (7)														X	
Dissemination		X	X	X	X	X	X	X	X	X	X	X	X		
Dissemination of media														X	
Dissemination of information														X	
Distant exchange (7)														X	
Distribution		X	X								X	X	X	X	
Distribution center (5)															
Distribution of publications										X					
Document dissemination		X									X				
Documentation services (7)		X													
Exchange of documents, information, etc. (7)													X		
Exchange of information (7)														X	
Exhibition														X	
Exhibiting	X									X		X	X		
Frequency			X						X	X					

GROUP XXII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Information exchange (7)		X								X					
Lending (7)										X			X		
Library loans (7)														X	
Non-written communications											X				
Oral communications		X			X										
Personal exchanges											X				
Publication costs		X													
Publication exchange (7)												X			
Publishers (2)		X	X		X					X				X	
Referral (7)			X												
Selective dissemination										X					
Selective dissemination of information		X													
Selective dissemination of information services (5)					X										
Selective dissemination of information system									X						
User profile														X	

GROUP XXII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Visual displays		X													
Visual-aural material												X			

GROUP XXIII

Equipment & Software

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Accounting machines	X														
Accumulator			X												
Adding machines	X														
Addressograph	X									X					
Algebraic compilers	X														
Analog			X			X			X						
Analog computer	X				X					X			X		
Analog equipment	X														
Analog networks					X										
Analog-digital conversion techniques				X											
Analog-to-digital converter	X														
Analogic computers											X				
Aperture card (s)	X	X	X		X		X			X		X			
Apparatus			X							X					

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Archive (s)			X		X		X		X			X	X		
Artificial languages	X	X		X	X									X	
Assembly programs											X				
Audio methods									X						
Audiovisual			X												
Audiovisual documents										X					
Automated selection (10)												X			
Automatic analysis (12)		X													
Automatic compilation of data tables					X										
Automatic programming		X			X										
Automatic typewriters														X	
Autoprogramming											X				
Auxiliary equipment			X								X				
Batten card														X	
Bit (s)			X		X							X			
Border punched cards														X	

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Buffer			X												
Building (s)		X	X							X					
Business machines		X													
Calculator		X	X												
Camera (s)		X	X		X				X	X			X		
Card	X	X	X			X			X		X	X		X	
Card decks					X										
Card reader, scanness, sorters		X													
Cardiovascular		X	X												
Catalog cards (8)					X					X		X	X		
Cathode ray tube		X							X						
Channel			X							X					
Character readers		X								X					
Circuits		X	X												
Circuitry									X						
Column			X												

GROUP XXIII - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Compiler (s)		X	X						X					
Component (s)			X							X				
Composing machines										X				
Computer			X						X	X		X		
Computer analysis of medical records (12)				X										
Computer center (s) (5)		X								X				
Computer conferences (2)			X											
Computer controlled chart preparation				X										
Computer controlled printing				X										
Computer design		X												
Computer curriculum (2)			X											
Computer language data		X												
Computer languages		X												
Computer logic		X			X									
Computer memory		X								X				
Computer methods (10)														X

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Computer operation					X										
Computer programs (ing)	X				X					X					
Computer systems	X														
Computer tape costs															
Computer tapes	X														
Computer techniques (10)	X														
Computer - analogue										X					
Computers	X				X	X	X	X			X	X	X	X	
Computing service (5)											X				
Computing techniques (10)														X	
Console									X						
Content addressable memories				X											
Contingency tables									X						
Control programs										X					
Control system (s)	X									X					
Control unit										X					

GROUP XXIII - (Continued)

Term	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Conventional machines													X	
Converter (s)					X						X		X	
Conveyors										X				
Copier (s)										X				
Copyflo		X												
Core		X												
Core memory		X												
CRT device										X				
Cutter														
Cybertron		X												
Data converter		X												
Data displays		X												
Data phone		X												
Data processing (10)	X	X			X	X	X	X	X			X		
Data processing centers (5)		X												
Data processing equipment		X									X			

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Data processing operations		X													
Data processing system		X													
Data processing system theory (10)				X											
Data systems		X													
Debug									X						
Debugging					X										
Device (s)			X							X					
Dictating machines					X					X			X		
Digital computer (s)					X								X		
Digital data communications (10)				X											
Digital systems				X											
Display		X	X			X									
Display consoles									X						
Display converters		X			X										
Display equipment		X													
Display screen										X					

GROUP XXIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Drum										X	X				
Electromechanical data-processing equipment	X														
Electronic digital computers	X														
Electronic equipment													X		
Electronic printer		X													
Electronic scanners		X													
Electronic selector										X					
Electrostatic printer		X													
Electrowriter										X					
Engineer (2)		X								X	X				
Equipment	X	X	X			X	X		X	X	X	X			
Equipment costs		X													
Equipments in information work														X	
Executive routines										X					
Facility				X						X					
Filing cabinets														X	

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Filing equipment	X									X					
Film recorder										X					
Finite state machine										X					
Flexowriters		X			X				X	X		X	X		
Flow diagrams	X														
Flowsheets										X					
Flying-spot scanners		X													
Gap			X						X						
General purpose system										X					
simulators															
Hardware		X			X					X	X				
Heuristic programming				X											
Heuristic simulation											X				
High-speed printer		X													
Hybrid computers										X	X				
Imprinter		X													

GROUP XXIII - (Continued)

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Input consoles				X										
Input devices		X												
Input-output equipment	X													
Instrumentation		X	X											
Justowriter		X												
Learning machines		X												
Library automation (5)				X										
Library of Congress card (8)										X				
Library equipment											X			
Library mechanization (5)		X									X			
Subject card (8)			X											
Light pen		X							X					
List processing languages				X										
Machine (s)		X	X		X				X	X			X	
Machine language (s)		X			X					X		X	X	
Magnetic character reader		X												

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Metaprograms											X				
Microcard reader					X										
Microfiche reader	X														
Microfilm printer	X														
Microfilm equipment	X														
Microfilm readers	X														
Multi-programming				X						X	X				
Optical character reader	X														
Optical scanners	X														
Output device	X														
Parts & elements of machines													X		
Peripheral equipment	X										X				
Phonetic typewriter	X														
Photocomposer										X					
Photocopier										X					
Photoelectric readers	X														

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Photographic equipment							X								
Phototypesetter									X						
Print readers		X													
Printer (s)		X	X		X										
Printing machines													X		
Processor (s)		X	X							X					
Program		X								X					
Programmer (2)		X	X							X	X		X		
Programming	X	X	X		X				X	X		X	X		
Programming languages		X												X	
Programming systems		X							X						
Programming techniques											X				
Programs	X	X				X				X	X		X		
Projector															
Punched card machine (s)					X									X	
Punched-card machinery		X													

GROUP XXIII - (Continued)

<u>Term</u>	<u>List Code Numbers</u>														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Punching device												X			
Reader (s)		X	X							X					
Reader printers					X										
Reading devices		X													
Reading equipment	X														
Reading machines					X										
Real time computers		X													
Recording devices										X					
Reel												X			
Register (s)					X					X					
Remote consoles input & output				X											
Reproducers														X	
Reproduction equipment	X														
Retrieval equipment		X													
Scanners		X			X										
Search comparator		X										X			

GROUP XXIII - (Continued)

Term	List Code Numbers														TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23	
Simulators										X					
Software		X			X				X						
Sorter		X	X		X								X		
Sorting machines										X			X		
Special index analyzer		X											X		
Storage device		X													
Subject card (8)			X												
Subroutine										X	X				
Tabulating machines													X		
Tabulators													X		
Tape converter		X													
Tape punches		X													
Tape readers		X													
Tape recorders					X										
Tape records														X	
Tape typewriter		X	X	X					X						

GROUP XXIII - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Technician (2)			X												
Telephone	X	X								X	X			X	
Teleprinters		X			X									X	
Teleprocessing		X			X										
Telereference														X	
Teletype		X							X	X					
Telex device										X					
Threaded list (16)									X						
Time sharing systems				X											
Turning machine									X						
Types of machines														X	
Typewriter (s)	X	X	X		X					X				X	
Verification (16)														X	
Verifiers														X	
Vertical files														X	
Videograph		X													

GROUP XXIII - (Continued)

<u>Term</u>	<u>List Code Numbers</u>													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Viewers		X			X									
Vocoders		X												
Vocoders & other speech compression devices				X										

GROUP XXIV

Terminology & Lexicography

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Advertisements										X					
Ambiguity						X			X						
Automatic syntax analysis				X											
Cognates					X										
Computer terminology		X													
Context free grammars										X					
Context-free									X						
Context, sensitive									X						
Controlled term lists					X										
Definition (s)	X	X	X		X				X	X			X		
Definition of information		X													
Denotation													X		
Denotions													X		
Descriptions					X	X						X		X	
Dictionary (ies)	X	X	X		X	X			X	X	X	X		X	

GROUP XXIV - (Continued)

Term	List Code Numbers													
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Difference			X											
Discourse									X					
Discussion			X											
Documentary syntax										X				
Documentation languages													X	
Docutems					X									
Foreign languages		X												
Formal language										X				
Free language					X									
General language										X				
Generalization					X									
Glossary		X	X		X				X	X	X		X	
Grammar (4)		X	X		X				X		X	X		
Grammatical analysis (4)											X			
Human language		X												
Language (s)	X	X	X		X						X		X	X

GROUP XXIV - (Continued)

Term	List Code Numbers													TOTAL
	1	3	4	5	8	12	13	14	15	18	19	20	21	23
Language, formal									X					
Language, natural									X					
Language analysis		X			X								X	
Lexical			X						X					
Lexicon		X								X				
Microthesaurus (i)		X			X									
Multilingual dictionaries					X								X	
Natural language (s)	X	X			X					X				
Object language (23)													X	
Polyglot dictionaries													X	
Retrieval vocabulary		X												
Roget Thesaurus										X				
Scientific language		X												
Search language (21)		X												
Scope note														X
Semantic dictionary														

GROUP XXIV - (Continued)

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Specificity									X	X					
Terminology	X	X			X	X	X			X	X	X	X		
Thesaurus (i, es)	X	X	X	X	X	X	X		X	X	X	X	X		
Thesaurus construction		X													
Vocabulary (ies)		X	X		X				X	X	X		X		
Vocabulary control		X													
Word (s)		X	X		X	X			X	X			X		
Word association		X													

GROUP XXV

Standardization

Term

List Code Numbers

	1	3	4	5	8	12	13	14	15	18	19	20	21	23	TOTAL
Abbreviation (s) (19)	X	X	X		X	X			X	X		X			
Anglo American rules (13)										X					
Hyphenation		X								X					
Rule (s)			X		X					X		X	X		
Standard			X							X					
Standard format										X					
Standardization			X					X			X		X		
Standardized language (24)	X														
Standards					X	X			X	X		X	X	X	

APPENDIX B

TABLE XVI a

CLASSIFICATION SYSTEMS T'

GROUP XVI

L₀ CLASSIFICATION AND INDEXING

1	4	5	3	12	13	14	15	19	20	21
Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classifica- tion	Classi- fication
		Classifica- tion and organization of knowledge			Reclassifica- tion					

TABLE XVI b

CLASSIFICATION SYSTEMS T'

4	21	18
Classify	Classify	Classify

TABLE XVI C

GROUP XVI

CLASSIFICATION SYSTEMS T'

L₀ CLASSIFICATION AND INDEXING

1	3	5	8	14	18	21	4	21	15
Classification Systems	Classification Systems	Classification Systems	Classification Systems	Classification Systems	Classification Systems	Classification Systems	Bliss Classification	Bliss Classification	
							Bliss Classification	Bliss Classification	
	Colon Classification		Colon Classification		Colon Classification	Colon Classification	Brussels Classification		
	Decimal Classification		Decimal Classification						
Dewey Decimal Classification	Dewey Decimal Classification		Dewey Decimal Classification		Dewey Decimal Classification	Dewey Decimal Classification		Dewey Decimal Classification	
Library of Congress Classification	Library of Congress Classification		Library of Congress Classification		Library of Congress Classification	Library of Congress Classification		Library of Congress Classification	
UDC	UDC		UDC	UDC	UDC	UDC	UDC	UDC	UDC

TABLE XVI d

GROUP XVI

METHODS OF CLASSIFICATION T'

L₀ CLASSIFICATION AND INDEXING

1	3	4	5	8	19	20	21
Facet Classification						Alphabetical Classification	Analytico-Synthetic Classification
							Coordinate Classification
	Decimal Classification						Decimal Classification
	Documentary Classification						
							Enumerative Classification
Facet Classification	Facet Classification			Facet Classification	Facet Classification	Facet Classification	Facet Classification
							Hierarchical Classification
	Library Classification						
							Multi-aspect Classifications
Subject Classification	Subject Classification		Subject Classification			Subject Classification	
		Taxonomic					

TABLE XVI e

GROUP XVI

CLASSIFICATION AND INDEXING

ELEMENTS OF CLASSIFICATION T'

21	3	4	8	15	18	12	13
Classification Elements							
	Aspects	Aspects	Aspects				
Category (ies)	Category (ies)	Category (ies)	Category (ies)	Category (ies)	Category (ies)		
Class	Class	Class	Class				
Designations							
		Division (s)	Division (s)				
		Facet (s)	Facet (s)	Facet (s)		Facet (s)	
Facet (s)	Generic (s)	Generic (s)	Generic (s)	Generic (s)	Generic (s)		
		Hierarchical	Hierarchic Chain		Hierarchical		
		Hierarchy (ies)	Hierarchy (ies)	Hierarchy (ies)		Hierarchy (ies)	Hierarchy (ies)
					Latent class		
			Polyhierarchy				
		Schedule (s)	Schedule (s)				
		Scheme			Scheme		
		Taxonomy	Taxonomy				
				Tree structure	Tree hierarchy		

TABLE XVI f

GROUP XVI

INDEXING T'

L_C CLASSIFICATION AND INDEXING

1	3	4	5	8	12	15	18	20	21
Indexing	Indexing	Indexing	Indexing	Indexing	Indexing	Indexing	Indexing	Indexing	Indexing

TABLE XVI g

INDEXING SYSTEMS T'

3	4	5	15	18	20
Indexing Systems	Indexing Systems	Indexing Systems	Indexing Systems	Indexing Systems	Indexing Systems
Uniterm System					
Termatrix	Termatrix	Termatrix	Termatrix	Termatrix	Termatrix

TABLE XVI h

GROUP XVI

INDEXING ELEMENTS T' L₀ CLASSIFICATION AND INDEXING

1	3	4	8	12	13	15	18	19	20	21
Concepts	Association Factors Concepts	Concepts, Modifier, Topics	Concepts, Modifier, Notions, Topics	Concepts		Concepts	Correlation Factors Concepts		Concepts	Concepts
Descriptor	Descriptor	Descriptor	Catchwords, Descriptors, Free terms, Index entries, Indexing terms, Key terms, Keyword, Polyterms Terms, Uniters	Keyword Uniters		Descriptor	Descriptor		Descriptor	Descriptor
:	Key terms Keyword Terms Uniters Links	Keyword Terms Uniters Links	Key terms, Keyword, Polyterms Terms, Uniters Links	Keyword Uniters		Terms Uniters	Index term Keyword Terms Uniters Link		Keyword Uniters Links	Keyword Terms Links
Links	Links	Links	Links	Links and roles Roles	Links	Roles	Link indicator		Uniters Links	Links
Role indicators	Roles Role indicators	Roles	Roles Role indicators	Links and roles Roles	Roles	Roles	Roles Role indicators		Roles	Roles

TABLE XVI 1

GROUP XVI

INDEXING TECHNIQUES T'
L₀ CLASSIFICATION AND INDEXING

1	3	4	5	8	12	13	15	18	20	21
Coordinate Indexing	Indexing Techniques	Chain	Coordinate Indexing	Relational Indexing			Chain	Coordinate Indexing	Coordinate Indexing	
	Alphabetical Indexing									
	Associative Indexing									
Coordinate Indexing	Uniterm Indexing	Coordinate Indexing	Coordinate Indexing	Coordinate Indexing	Coupling		Coupling			
	Deep Indexing	Correlative								
		Coupling								
Indexing KWIC Indexing	Probabilistic Indexing	Indexing KWIC Indexing	Indexing KWIC Indexing	Keyword Frequency Rank	Indexing	Statistical Methods Index.	Ranked	Frequency Analysis Generic Posting	Indexing KWIC Indexing	Indexing KWIC Indexing
Indexing KWIC Indexing	Source Indexing	Indexing KWIC Indexing	Indexing KWIC Indexing	Posting		Subject Indexing	Linking			Post
	Uniterm Indexing									
				Verbal Indexing						

TABLE XVI j

GROUP XVI

L₀ CLASSIFICATION AND INDEXING

INDEXES T'

3	4	8	13	15	18	19	20	21	23
								Types of indexes and other word lists	
		Chain Index			Chain Index			Chain Index	
					Class Thesaurus				
Coordinate Index		Uniterm Index				Coordinate Index			
Correlative Index								Correlative Index	
Cumulative Index		Cumulative Index			Cumulative Index			Cumulative Index	
			Precoordinate Index						Inverted Index
Scan Column Index	Scan Column			Scan Column		Relative Index		Rotation Index	
Subject Index		Subject Index			Subject Index		Subject Index		
				Threaded List					
		Uniterm Index							
Word List		Word List							